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'Some mix it with other things to smoke': Perceived use and misuse of ARV by street thugs in Tshwane District, South Africa

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Abstract

The increasing numbers of people living with HIV (Human immunodeficiency virus) and the availability of HIV anti-retroviral therapies (ARVs) have brought attention to the misuse and diversion of ARVs. ARVs are reportedly diverted by street thugs into a new illusive and addictive drug called "Nyaope or "Whoonga". The purpose of the study was to explore and describe the experiences of Members of HIV and AIDS and Related Malnutrition Communities of Practice (CoPs) regarding the perceived diversion of ARVs in the Tshwane district of South Africa. A qualitative, descriptive study was done. Purposive sampling was used to select the participants, who were members of the CoP working with HIV and AIDS. A total of 26 participants recruited from two Tshwane universities and hospitals were interviewed to explore their experiences regarding the diversion of ARVs in Tshwane. Interviews were transcribed verbatim. Participants reported that most people on ARVs and their families knew about the side effects of ARVs, with emphasis on the hallucinogenic effect of some ARVs which were targeted by street thugs for redesigning into "Nyaope". The ARV drug said to be used for this purpose was Efivarenz. How the ARVs got into the hands of illegal drug dealers remains unknown. However there were suggestions that HIV positive patients were robbed of their HIV medicines or some sold the medicines. Through these illegal routes, there were concerns that ARVs were becoming available to street thugs who then use them to make a new drug called "Nyaope" or "Whoonga" which is smoked for recreational purposes. Participants recommended that there should be increased efforts to protect the confidentiality of persons living with HIV so they are not targeted by illicit drug dealers. The launch of the fixed-drug-combination (FDC) in South Africa needs to be controlled and monitored.

Keywords: ARVs, "Nyaope", "Whoonga", drug diversion, HIV, Tshwane.

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Introduction

The increasing numbers of people living with HIV and AIDS and the availability of anti-retroviral therapies (ARVs) has also brought attention to the misuse and diversion of ARVs. Drug diversion is the unlawful channeling of regulated pharmaceuticals from legal sources to illicit markets and this can occur at the

point of drug manufacturing, during distribution and from patients themselves (Inciardi *et al.*, 2007). There is relatively limited knowledge about the sources of diverted drugs and this lack of knowledge remains the 'black box' of drug diversion (Inciardi, *et al*., 2009). The Internet has been found to be an insignificant source, with major sources including drug dealers, relatives and friends of patients and patients themselves (Inciardi *et al*., 2009).

Diversion of ARVs in South Africa has reported in local newspapers and on the Internet. The main theme emerging from these reports is that the availability of ARVs has also created 'havoc' for some populations in South Africa, as street thugs are stealing ARVs to reproduce the highly addictive drug "Nyaope", which is also known as "Whoonga" in KwaZulu Natal. According to media reports, the exact ingredients of "Nyaope/Whoonga" are elusive. Some sources claim it is a combination of cannabis and heroine (Modisane, 2010) or cannabis, heroine and a cutting agent (Moodley *et al*., 2012). 'Cutting agents' or 'adulterants,' are substances that are used to dilute illicit drugs with substances that are less expensive than the drug itself.

ARVs are 'cheap' and freely available. "Nyaope/Whoonga" is distributed as a white powder that is smoked and is a concoction that includes rat poison, soap powder and the main ingredient – ARVs (Strydom, 2010) or a combination of cannabis or heroin, rat-poison, and the ARV Efavirenz (The Citizen, 2011). To date "Whoonga" is not criminalised and the Times Live newspaper reported that there were plans to criminalise the drug (SA News, 2013). Although research is limited, there are newspaper articles, radio, and television and Internet blogs about "NyaopeWhoonga". There were media reports that people living with HIV and AIDS in South Africa were having their ARVs stolen by street thugs who used the ARVs to produce recreational drugs. There are reports of a number of primary health care facilities being broken into, with ARVs stolen by the thieves. The reports also claim that HIV and AIDS patients are having their ARVs stolen to reproduce "Nyaope/Whoonga" whilst other patients sell their ARVs. There are also media reports that some "Whoonga" addicts deliberately contract HIV and AIDS to access ARVs.

The diversion of ARVs is cause for concern. However, very few studies on "Whoonga" have been carried out and there is a lack of epidemiological data on this public health problem. Studies on drug addiction have not specifically focused on "Nyaope/Whoonga" although the drug is mentioned within the context of other illicit drugs in South Africa (Moodley *et al.*, 2012). A cross-sectional study amongst secondary school learners in part of the city of Tshwane reported a 2.9% prevalence of "Nyaope" amongst 809 participants (Moodley *et al.*, 2012). One of the few studies on "Whoonga" in South Africa was conducted by Grelotti *et al.* (2013) in a Durban township amongst 13 *Inkwari* attendees.

Inkwari is a Zulu slang for 'party' where young people congregate to dance and abuse alcohol.

Participants in the Durban township study described "Whoonga" or "Nyaope" as a 'new drug' that contained ARVs and other things. The side effects of "Whoonga" were said to be reminiscent of those of heroin or methamphetamine, which were common in this study area. Equally worrying was the involvement of children, who were said to be unwittingly addicted to the drug through 'space muffins' (Grelotti *et al.*, 2013). There are many stories reported in the South African media about the side effects of "Nyaope" such as severe addiction, which results in a rise in crime to finance the habit. "Nyaope" negatively affects the users, their families and communities (Hu, 2013).

On 8 April 2013, the South African National Minister of Health, Dr Aaron Motsoaledi launched the new HIV and AIDS drug. The triple combination drug is called the fixed-drug-combination (FDC), which will be prescribed to pregnant women, breast feeding mothers and newly diagnosed people (SA News, 2013). The purpose of this study therefore, is to explore and describe the experiences of members of HIV and AIDS and related malnutrition Community of Practice (CoP) in the Tshwane district of South Africa, where ARVs are rumoured as being diverted by street thugs for sale as "Nyaope". The development of "Nyaope" should take into account some of the developments in HIV and AIDS medicines that have implications for the street value of these drugs.

Methodology

A qualitative, explorative and descriptive study was conducted in the Tshwane district. Polit and Beck (2008) describe qualitative study as "the investigation of phenomena, typically in an in-depth and holistic fashion, through the collection of rich narrative materials using a flexible study design." In this study the qualitative research methods were used to explore and describe the experiences of members of HIV and AIDS and related malnutrition CoP regarding the diversion of ARVs in the Tshwane district of South Africa**.**

An exploratory study is described by Brink (2006) as a study that is aimed at exploring the in-depth knowledge and understanding of values, beliefs, norms, practices, perceptions of a selected population group through asking questions and probing until data saturation occurs. Brown (2006) states that an "exploratory study provides insights and comprehension of an issue or situation." In this study the researchers conducted one-to-one interviews to explore the experiences of members of HIV and AIDS and related malnutrition community of practice (CoP) regarding their knowledge about the diversion of ARVs in the Tshwane district of South Africa.

Descriptive study "has its main objective as the accurate portrayal of the characteristics of persons, situations, or groups, and/or the frequency with which certain phenomena occur" (Polit & Beck, 2008). Furthermore, Shields and Hassan (2006) add that descriptive studies "describe data and characteristics about the population or phenomenon being studied". In this study the researchers described the experiences of members of HIV and AIDS and related malnutrition community of practice (CoP) regarding the diversion of ARVs in the Tshwane district of South Africa.

Setting

Tshwane is one of South Africa's eight metropolitan municipalities- large densely urbanised regions that encompass multiple cities and so constitute a metropolis. Its major urban and semi-urban areas include Pretoria, Centurion, Akasia, Soshanguve, Mabopane, Atteridgeville, Ga-Rankuwa, Winterveldt, Hammanskraal, Temba, Pienaarsrivier, Crocodile River and Mamelodi. The municipality was established on the 5th December, 2000 through the integration of various municipalities and councils that had previously served greater Pretoria and surrounding areas. This study was conducted at selected hospitals and universities in Tshwane where members of the HIV and AIDS and related malnutrition CoP were working. Private premises within the universities and the selected hospitals were used as the setting for data collection.

Data reported in this article follow on from a study that was set to explore and describe the experiences of participants who were members of the HIV and AIDS and related malnutrition CoP regarding their knowledge of the diversion of ARVs in Tshwane district. The CoP is a group of healthcare workers who share common interest in HIV and AIDS, they interact, communicate, share information and personal experiences and work together towards the prevention and management of HIV and AIDS (Cambridge, Kaplan & Suter, 2005). It was through the sharing of information and personal experiences that "Nyaope" became a topic of interest amongst participants.

Study design

Population and sampling

The population for the study comprised members of HIV and AIDS and related malnutrition CoP which included university staff and staff members from the two public sector hospitals in Tshwane where ARVs were distributed. Participants were purposively selected to include CoP members who deal with the prevention and treatment of HIV and AIDS at different levels. The lay counsellors conduct voluntary counselling and testing, nurses and allied healthcare workers deal with the initiation, issuing and supply of ARVs, support

workers provide on-going support to clients living with HIV and AIDS and the university staff and students teach, learn and conduct awareness campaigns in the community regarding HIV and AIDS. The sample size consisted of 26 participants (22 females and 4 males).

Participants were recruited using the Cop Database and the information sheet was emailed to members in HIV and AIDS and sexual health departments and the universities. Potential participants, interested in taking part in the project expressed their intentions by emailing or telephoning the researchers to arrange suitable dates and times for the interviews. Interviews were conducted in private premises within the universities or public hospitals. Before the interviews, participants were given the information sheet so as to re-familiarise themselves with the aims of the project and to ask questions that help to clarify the aims of the study.

Data collection

Semi-structured interviews were used, to allow for the exploration of emergent and interesting themes during the interview and reduce the reliance on pre-set questions. We were reminded that this method of interviewing allows the researcher to follow 'interesting avenues' whilst being guided by the interview schedule rather than being dictated to by it (Smith, 2005). One of the emergent and interesting themes was the "Nyaope" phenomenon. The interviews were conducted in English by the first author and a research assistant. All interviews were recorded and lasted 45 minutes. Data collection ended when there was no new information emerging from the interviews i.e., when data saturation was reached.

Data analysis

All authors were involved in data analysis, interpretation of the results and writing of the article. The interviews were transcribed verbatim. The transcripts were then subjected to thematic framework as outlined by Ritchie and Spencer (1994). The thematic framework follows five steps of analysing interview transcripts, which are: familiarisation, identifying a thematic framework, indexing, charting, mapping and interpreting. These steps were used for this research as they offered an opportunity to explore and describe the experiences of CoP members regarding diversion of ARVs in Tshwane, South Africa. The transcripts were coded thematically and subjected to iterative analysis using the framework method of data analysis. The main points of analysis included:

a) Manipulating the drug's side effects for recreation
b) Commodifying ARVs

Ethical considerations

Data for this study were collected in 2013 after the study was approved by the University of Pretoria's Ethics Committee. This study was conducted after ethical clearance was received from the University of Pretoria's Ethics Committee, and permission granted by the Gauteng Department of Health and the Tshwane district. Informed consent was obtained from all the participants before the interviews took place. When it was established that the participants clearly understood the aims of the study and what their participation entailed, they then signed the consent form. All pertinent ethical principles such as beneficence, respect for human dignity and justice for conducting a research study were adhered to and ensured.

Results

Twenty-six participants were interviewed and these included nurses (N=3), lecturers (N=7), nursing students from the two universities (N=3), support workers (N=3), lay counsellors (N=7) and allied health care workers (N=3). Most of the participants were females (N=22) and only four (4) were males. Two main themes emerged from the data analysis, namely: manipulating the side-effects of ARVs for recreation and commodifying the ARVs.

Manipulating the side effects of ARVs for recreation

The participants reported that they were aware that some people in Tshwane were manipulating the hallucinogenic effects of ARVs for recreation purpose by redesigning the ARV drugs to form a new drug called "Nyaope. Participants also reported that there were particular ingredients in the ARVs which were said to have a hallucinogenic effect. The perceived hallucinogenic substance in ARV medicines was said to be the target of some street thugs so that this supposedly hallucinogenic product could be 'redesigned'. The particular medicine within the ARV treatment regimes which was said to be hallucinogenic was Efavirenz. One participant put it this way when describing the perceived side effects of Efavirenz:

"It (Efavirenz)makes you feel comfortable, I don't know what it is doing but people who are taking that drug sometimes when we are talking to them we ask '…what is the medication doing to you?' They say: 'oooooh my bed is rocking (participant laughs). Or sometimes I see people who died a long time ago' (Female participant).

The content of this transcript indicates that the drug is said to have some hallucinogenic effects as described by the participant whose words are transcribed above. Efavirenz is a non-nucleoside reverse transcriptase inhibitor

(NNRTI), which works by blocking the progression of HIV and AIDS. Most HIV medicines were said to have some side effects and Efavirenz was no exception. However, it had a preferred side effect, which was the perceived hallucination that resulted after taking Efavirenz. The drug also has psychoactive side-effects, resulting in pre-treatment resistance to ARVs as a result of the use of "Nyaope" or "Whoonga" (Grelotti *et al*., 2013).

Another participant said:

"They are very clever these addicts (laughing). Some other medicine side effects are used to treat other effects as well, so since Efivarenz has a hallucinating effect then they used it to get high". (Female participant).

However, some health care workers were unsure of how street thugs – particularly those who were not HIV and AIDS patients – had information about ARVs' side effects as well as the sources of the drugs:

"I don't know maybe there was somebody who was telling them about the medication or there is somebody who is selling it. I don't know. Because there is a tablet called Efivarenz and people like it because they know it's a real drug because if you are taking it you can hallucinate" (Female participant).

Participants reported that these side effects were viewed favourably by some street thugs as the effects were similar to those from recreational drugs that cause one to 'get high'. The perceived feelings of 'comfort' and 'being high' obtained from the drug's side effects were reported as the reason for the use of some ARVs for recreation. A male participant reported:

"These side effects are similar to some of recreational drugs and as the drug can be accessed free or we think they buy it from HIV-positive patients or steal if from them. It may then be used in combination with other drugs" (Male participant).

Ways of manipulating the ARV drugs to turn them into 'fun' drugs' were less clear. Some health workers reported that they believed that the drug Efavirenz is mixed with others 'things' and smoked: One said:

"They create their own drug to excite themselves. I'm not sure what they are mixing it with but I do know they use Efivarenz *Yes; we call it "Nyaope"; they mix Efivarenz with other drugs and they smoke it. Then they become high. This area has a lot of people on the drug. There is even one male professional nurse using "Nyaope". They use it like a recreational drug...Yes; they call it ""Whoonga" (female participant).*

The use of Efivarenz was highlighted by the participants, as well as the mixing of Efivarenz with other substances to create 'stimulating' or 'fun' drug.

Most of the participants emphasised the manipulation and transformation of ARVs by street thugs into new drug called "Nyaope". The street thugs enjoy the hallucinogenic side effects of the ARVs and this has led to HIV and AIDS clients being robbed of the drugs while on their way home or even in their houses. According to Steadman (2013), people using ARVs are training their bodies to be immune to ARVs, so that when they are due to use the drug, it will no longer be effective.

Commodifying ARVs

ARVs were said to be owned, stolen or sold to street thugs who transformed them into the new drug "Nyaope". South African public sector hospitals provide ARVs free of charge to people who need them. The goals of the South African treatment guidelines (DoH, 2013) is to decentralise treatment to primary care and implement nurse-initiated treatment which is cost effective and brings the best health outcome for people living with HIV and AIDS. The guidelines also stress the importance of starting treatment earlier (CD4 count less than 350mm cells) and fast track the provision of ARVs to those who are eligible. Accordingly, if HIV and AIDS patients lose their ARVs they are entitled to a replacement of the stolen medicines so as not to disrupt adherence.

Participants reported that there were previous concerns regarding the numbers of reported 'stolen' ARVs from patients when leaving ARV treatment centres. One male participant described the situation as follows:

"Sometimes it is true that patients' medicines have been stolen on the way home as there are people who come into the clinic and spot those collecting ARVs" (male participant).

ARVs were said to be stolen from some HIV and AIDS patients and sold to street thugs who 'cooked' "Nyaope" using the tablets. The numbers of patients who reported that ARVs had been stolen also raised some concerns amongst the practitioners, as some patients were perceived as being in denial that they were HIV positive but accepted the ARVs for other purposes, such as selling. In other areas of South Africa health care practitioners as well as patients were targeted and robbed of their ARVs in order to make "Nyaope", as the demand on the street was increasing (The New Age, 2012). For example one participant reported this issue:

"There are people who still do not believe that they are HIV positive and only agree to treatment for commercial purposes. That is why the ARVs are under

controlled access because some clients will go to different clinics collecting treatment in order to sell it" (Female participant).

Participants reported that they believed that the medicines would then be sold for cash to street thugs. There was a perception that some patients registered with more than one ARV treatment centre to maximise their gains:

"There are some few patients who make use of more than one ARV treatment centre so as to access ARVs for selling. Yes they sell their medicine and then say their medicine is lost…" (Female participant)

Participants also reported that there were reports that some HIV-positive people were being robbed in their homes:

"We've had patients' house broken into just to get hold of their treatment. So it is very worrying because they actually get mugged for their treatment" (Male participant).

Patients were robbed at home as they are known by other service users when attending ARV clinics. Sharing confidentiality within the clinics in the presence of other service users compromised safety, though the discussion occurs behind closed doors as described by the participant below:

"Some people come… if people are coming for medication when they go home some of the people come and steal their medication because when they are at wellness clinic there is a wall, a big wall. They know each other. Every time when they are at the wellness I can say OK these people are the same… we take this medication together so I know what I need from them" (Female participant).

Patients who report that their ARVs have been 'lost' or 'stolen' are then referred by health care providers to a police station to report the case before another supply is provided. The move to refer patients with 'lost' ARVs to police stations has led to the reduction in the number of reported cases of 'losses at HIV and AIDS treatment centres. There has also been a decrease in the numbers of reported stolen ARVs. One participant put it this way:

"Because of poverty they sold their treatment so we usually told them to go and open a case at the police station and get a letter from them. Now the incident has decreased because some were selling it and come back and claim that it's stolen" (Female participant).

Discussion

Nyaope is a serious threat to South Africa's public health as commercial exchange in Nyaope potentially denies people living with HIV/AIDS the required clinical adherence to ARVs as streets drug-users, according to SA News (2013), steal, and rob HIV/AIDs patients, clinics and doctors' surgeries of ARVs to make Nyaope. Limited adherence to ARVs has implications on viral load and resistance to ARVs. However, the relationship between ARV adherence and resistance is much more complicated and beyond the scope of this paper (Bangsberg, Moss & Deeks, 2004). The authors in their review of the complex relationship between ARV adherence and resistance argue that there are others who propose that mechanisms to support adherence should be in place, particularly in low resourced settings as there are potential dangers of transmitting drug resistant HIV. It is therefore important that in South Africa, ARV adherence support mechanisms are in place to ensure that the people living with HIV are not harassed for their medications, which in turn affects adherence to ARVs if medications are stolen or sold.

The selling of ARVs by person living with HIV should be understood within the context of poverty that affects many people living with HIV in semi-rural settings in South Africa. For those who sell their medicines for a profit, the value of this medicine is then seen in financial terms as ARVs are sold. Poverty drives some people to sell medicines. However, the emergence of "Nyaope" in the streets of Tshwane as a recreational drug is not a new phenomenon in South Africa. Financial gains have motivated 'drug lords' resulting in negative health impacts for those who get addicted due to "Nyaope". In the Western Cape, cheap drugs are available in the streets and these are known by different other names exist. Drugs named differently by diverse users such as "tik" were available on the streets sometimes to generate income by the poor (Nyabadza & Hove-Musekwa, 2010).

Media reports confirm that the use of "Nyaope" was a continuation of the habits of the drug-users who sniff glue, smoke dagga or marijuana and take benzene (SA News, 2013). The "Nyaope" ingredients, which according to the media reports include marijuana, heroin, rat poison and ARVs, particularly Efivarenz, are harmful to the human body. The practices of using "Nyaope" as a recreational drug are similar to the use of new designer stimulants called "bath salts" and cannabinoids called "spice," along with the abuse of prescription drugs and volatile substances which are now widely recognized health problems in many societies (Albertson, 2014). However, there is limited empirical research evidence to support the claims from the media. The lack of evidence as to whether patients also use the Efivarenz for recreational purpose as "Nyaope" necessitates more research into this phenomenon. It was found that patients

diagnosed with chronic conditions such as diabetic mellitus who presented with diabetic ketoacidosis were using recreational drugs (Isidro & Jorge, 2013).

Criminalising Nyaope trafficking has been articulated in some sections of the community as a response to the reports that some patients are robbed of ARVs on their way home or from their homes. In addition some HIV-positive patients who are prescribed ARVs are reported to be selling the drugs to the street gangs and later claim to have been robbed so as to get more ARV supplies. The Treatment Action Campaign (TAC) and National Association of People Living with AIDS (NAPWA) have requested the government to introduce stricter methods to stop the smuggling of ARVs by street thugs, thus reducing the risks for HIV/AIDs patients being robbed. Others have suggested that the state should embark on crime prevention by investigating the prevalence of the recreational use of ARVs (Davis *et al*., 2013). In the USA tough interventions were initially implemented to address the drug abuse problem; but they have abandoned the "get tough" approach and adopted a rehabilitative approach. The drug court model has gained popularity as a community-based intervention (Shaffer et al., 2011). The targeting of people living with HIV for robbing them of ARVs challenges the healthcare sector to develop appropriate interventions to mitigate this practice and ensure compliance of patients on ARVs.

Conclusions

This study was informed by research conducted on experiences of health care providers who were members of the HIV and AIDS and related malnutrition CoP in Tshwane. Their narratives about "Nyaope" were based on their experiences of working with patients living with HIV and AIDS. Various issues regarding the experiences of healthcare workers were explored and described. The most revealing themes on experiences were manipulating the side effects of ARVs for recreation and commodifying ARVs. Many clients are robbed of their ARVs, leaving these clients without any medication, thus increasing the rate of HIV and AIDS.

The development of "Nyaope" should take into account some of the developments in HIV and AIDS medicines that have implications for the street value of these drugs. According to the Ministry of Health, the FDC drug is being prescribed to pregnant women, breast feeding mothers and newly diagnosed people. This drug, which is available in all the provinces, reduces the burden of taking many separate HIV and AIDS tablets. Accordingly, the FDC will eventually be given to all the newly diagnosed patients, irrespective of their CD4 count (SA News Agency, 2013). The impact of a combination drug on the street value and life of "Nyaope" on the street is unknown. Some local youth try to seek help from local rehabilitation centres after experiencing severe complications.

Recommendations

Criminalising "Nyaope" dealers has been articulated in some sections of the community. Others have noted that the state should embark on crime prevention by investigating the prevalence of the recreational use of ARVs (Davis *et al*., 2013). With the new FDC in place the state should take precautions on issuing the drug, controlling and the managing it to prevent its misuse and abuse. Community members, including family members of HIV and AIDS patients should be involved in the campaign to eliminate illicit drug users from experimenting with life-prolonging drugs.

Limitations of the study

None of the participants reported that they had used "Nyaope". This study is therefore missing the vital voices of people who deal with, and use "Nyaope". Our sample is also confined to practitioners in the Tshwane district and does not include those from other areas of South Africa. Despite its limitations, this study has added to our understanding of the "Nyaope/Whoonga" phenomenon by analysing the views of Members of HIV and AIDS and Related Malnutrition CoP Practitioners, some of whom supply the ARVs to people living with HIV and AIDS.

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References

Albertson, T.E. (2014). Recreational drugs of abuse. *Clinical Reviews in Allergy & Immunology*, 46(1)1-2.

Bangsberg, D. R., Moss, A. R. & Deeks, S.G. (2004) Paradoxes of adherence and drug resistance to HIV antiretroviral therapy. *Journal of Antimicrobial Chemotherapy 33 (5) p 696-699.*

Bogdan, R.C. & Biklen, S.K. (2003). *Qualitative Research for Education. An Introduction to Theories and Methods* (4th ed.). South America: Pearson Education Group.

Brink, H. (2006). *Fundamentals of Research Methodology for Health Care Professionals*. University of South Africa (2nd ed.). Cape Town: Juta.

Brown, R. (2006). "Size of the Moon" "Scientific American" 51 (78). Available at http://en. Wikipeadia.org/wiki/Exploratory research. Date of access 2010/08/19.

Cambridge, D., Kaplan, S. & Suter, V. (2005). Community of practice design guide. *A Step by Step Guide for Designing & Cultivating Communities of Practice in Higher Education.* http.//net.educause.edu//ir/library/pdfnli0531.pdf Date of access 2013/11/28.

Davis, G.P., Surratt, H.L., Levin, F.R & Blaco, C. (2013). Antiretroviral medication: an emerging category of prescription drug misuse. (Accessed 28 November 2013).

Department of Health (2013). *The South African Antiretroviral Treatment Guidelines*. Pretoria: Department of Health.

Grelotti, D. J., Closson, E.F., Smit, J.A., Zonke Mabude, Z., Matthews, L.T., Safren, S.A., Bangsberg, D.R. & Mimiaga, M.J. (2013). Whoonga: Potential Recreational Use of HIV Antiretroviral medication in South Africa.

Hu, M. (2013). "Nyaope": dangerous drug, dangerous misconceptions. *Journal AIDS of Anova Health Institute* http://www.timeslive.co.za/local/2013/02/27/"Nyaope"-drug-to-be-criminalised

Inciardi, J.A., Surratt, H.L., Cicero, T.J., Kurtz S.P., Martin S.S. & Parrino, M.W. (2009). The "Black Box" of prescription drug diversion. *NIHPA Manuscripts*, 28(4), 332-347.

Inciardi, J.A., Surratt, H.L., Kurtz, S.P. & Cicero, T.J. (2007). The "Black Box" of prescription drug diversion. *NIHPA Manuscripts*, 28(4) 332-334.

Isidro, M.L. & Jorge, S. (2013). Recreational drug abuse in patients hospitalized for diabetic ketosis or diabetic ketoacidosis. *Acta Diabetologica*, 50(2)183-187.

Modisane, L. N. (2010). Relationship between cannabis use and psychiatric disorders in patients admitted at Dr George Mukhari Hospital Psychiatric Unit. Ga-Rankuwa: University of Limpopo, Medunsa Campus.

Moodley, S. V., Matjila, M. J. & Moosa, M. Y. H. (2012). Epidemiology of substance use among secondary school learners in Atteridgeville, Gauteng. *South African Journal of Psychiatry*, 18(1), 2-9.

Nyabadza, F. & D. Hove-Musekwa, S.D. (2010). Substance abuse in the Western Cape Province of South Africa: insights through mathematical modelling. The quarterly update on epidemiology from the South African Centre for Epidemiological Modelling and Analysis (SACEMA). www.sacemaquarterly.com (Accessed 10.March.2014)

Polit, D. F. & Beck, C.T. (2008). *Generating and Assessing Evidence for Nursing Practice* (8th ed.). Lippincot Williams & Wilkins, A Wolters Kluwer Business.

Ritchie, J. & Spencer, L. (1994). Qualitative data analysis for applied policy research.

SA News Agency (2013). South Africa begins single HIV drug rollout. Sapa. ARV theft is sabotage: Motsoaledi. Accessed March 2014.

Shaffer, D.K., Hartman, J.L., Listwan, S.J., Howell, T. & Latessa, E.I. (2011). Outcomes among drug court participants: Does drug of choice matter? *International Journal of Offender Therapy and Comparative Criminology*, 55(1), 155-174.

Shields, P. & Hassan T. (2006). Intermediate Theory. The missing Link in successful student scholarship. *Journal of Public Affairs Education,* 12 (3), 313 – 334.

Smith, J. (2005). The search for meanings: Semi-structured interviewing and qualitative analysis. In J. Smith, R. Harre & L. Van Langenhove (Eds.), *Rethinking Methods in Psychology*. London: Sage.

Strydom, J. (2010). Whoonga: The cruelest drug of South African slums. (Accessed 10 March 2014)

The Citizen (2011). www.thecitizen.co.tz/sunday-citizen/40-sunday-citizen-news/16396-arvs-abused-to-get-high.html (accessed April, 2013).