Evaluation of the use of traditional medicine among HIV/AIDS infected patients before and after antiretroviral programme around Durban and Ladysmith, KwaZulu–Natal Province of South Africa

Manimbulu Nlooto[1], Jamilah Karreem[2], Nonkululeko Felicity Dlamini[3], Sarah Bata[4], Amanda Nhlengethwa[5], Nokuthula Cynthia Radebe[6], Sinegugu Jali[7]

Abstract

African traditional health practitioners and those practicing other forms of traditional medicine are an important source of health care for many South Africans. Many HIV/AIDS patients use traditional medicine first before attempting western medicine and some use traditional medication in conjunction with western medicine. This study aimed to assess the use of traditional medicine by HIV patients prior to and after initiation of antiretroviral therapy in the public health sector. A cross-sectional study, using a researcher administered, semi-structured questionnaire, was conducted among 686 HIV infected patients in six accredited public sector antiretroviral clinics around Durban and Ladysmith areas of Kwa-Zulu Natal Province of South Africa. It was found that the majority of respondents (493/686, 71.9%) were female. Overall, about twenty-seven percent of respondents (188/686, 27.40%) indicated to have used traditional medicine before joining antiretroviral programmes. Over a third of respondents (253/686, 36.9%) indicated that their healthcare worker advised them against the concurrent use of traditional medicine with antiretroviral medicines. There was a significant reduction in the use of traditional medicine by HIV infected patients after joining antiretroviral programmes as less than four percent of respondents (24/686, 3.50%) reported ongoing use of traditional medicine ($p<0.05$). This finding suggests that patients may be implementing the advice given to them by their health care providers.

Keywords: HIV infection, complementary and alternative medicine, side effects, belief system

[1] Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal. Email: Nlooto@ukzn.ac.za;

[2] Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal.
[3] Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal.
[4] Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal.
[5] Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal.
[6] Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal.
[7] Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal.

Introduction

African traditional health practitioners and those practicing other forms of traditional medicine not common to African communities are an important source of health care for many South Africans. Thus, African traditional healing and other alternative medicines are a health resource in the South African society. The World Health Organisation (WHO) defines traditional medicine as "the sum of knowledge, skills and practices based on theories, beliefs and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illnesses" (WHO, 2008). Traditional medical practices can include the use of animal, mineral-based medicines, messages, spiritual therapies and a variety of other techniques unique to different regions and cultures (WHO, 2008) and herbs (some of which have been proven to be effective and have been used as the basis of medicines marketed by western pharmaceutical companies) (ETU, 2007).

One of the biggest challenges faced by South Africa is the high prevalence of Human Immunodeficiency Virus (HIV). The number of infected patients tends to increase on a daily basis. An estimated 10% of the total population was found to be HIV positive in 2013 (Statistics South Africa, 2013, Statistical Release P0302, Midyear Population estimates 2013).

South Africa has presently one of the most successful antiretroviral programmes on the African continent with at least two million people receiving antiretroviral therapy (Venter, 2012).

Traditional medicine is used for the treatment of medical problems as well as for disease prevention, but Bodeker et al.(2005) stated that "those with the most serious and debilitating medical conditions such as cancer, chronic pain and human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) tend to be the most users of such practices."

Worldwide there has been an increase in the use of traditional medicine in the past decade. Between 70% and 90 % of the population in Africa, Asia, Latin America and Middle East rely on traditional medicine to fulfil their health care needs; and equally developed countries like Canada, France, Germany and Italy indicated that between 70 and 90% of their population had used traditional medicines (Robinson and Zhang, 2005). Anecdotal evidence

from South Africa suggests that a number of ART patients resort to traditional medicine after experiencing side effects from ART (Peltzer, 2008).

Review of the literature has also shown that more people, worldwide, are taking traditional medicine in combination with prescribed antiretroviral medication. In South Africa, up to 90% of people living with HIV and AIDS use the services of a traditional healer before consulting biomedical healthcare providers (Mbatha et al. 2012). HIV/AIDS patients tend to use traditional medicines but the extent at which they utilize such practices is not well known.

HIV epidemic prevalence in South Africa is high with an estimated 17.3% among the general population. South Africa has a characteristic and cosmopolitan population made of four ethnic groups: Black African 79%, White 9.6%, Coloured 8.9% and Indian/Asian 2.5% (Stats SA, Mid-year population estimates, 2011). This diverse population may rely on different health systems either indigenous to African groups or adopted from other cultures such as Ayurveda, traditional Chinese medicine, Unani tibb, chiropractic, homeopathy, and other complementary and alternative medicines. Reviews have shown an increase of traditional medicine use worldwide but this worldwide increase is in contrast with a decline on the utilisation of traditional health practices and complementary or alternative medicine in South Africa among the general population despite the demonstrated role of such health practices in health care delivery in chronic conditions, HIV and other conditions as shown through many population-based and health-facility-based surveys (Peltzer, 2009). Many HIV/AIDS patients use traditional medicine first before attempting western medicine and some use traditional medication in conjunction with western medicine, illiteracy and lack of knowledge may be the reason why some patients do this (Burger et al., 2010). This leads to many challenges as some patients visit the health care centres at the last stage of their disease as they were not aware of their illness and status. In many parts of Africa, traditional healers are the most easily accessible health resource available to the community. In addition, they are most often the preferred option for the patients. For most of these people, traditional healers offer information, counselling and treatment to patients and their families in a personal manner as well as having an understanding of their client's environment (Mokaila, 2001).

Their personal touch and approach influence patients in relying on them for their health care needs, hence, patients on modern health care are tempted to use concurrently African traditional medications with medicines prescribed by modern medicine doctors. This study attempted to estimate the use of African traditional medicines by HIV-infected patients before and after their joining of an antiretroviral program in public sector healthcare facilities around Durban and Ladysmith areas, KwaZulu-Natal province, South Africa.

Methodology

Study design

A descriptive cross- sectional study was conducted in six accredited sites for HIV treatment. Research administered semi-structured questionnaires were used between June and August 2014 to collect data among HIV infected patients.

Study sites

Six public healthcare facilities were purposively selected in the health districts under study, These facilities included Uthukela and Ethekwini Metropolitan Health Districts of Kwa-Zulu Natal.

Study population, inclusion and exclusion criteria

HIV infected patients attending antiretroviral clinics in the six accredited sites were eligible for this study. Patients less than 18 years irrespective of sex and race were excluded from this study owing to their,….

Recruitment and selection of participants in the study

Study participants were approached during clinic visit hours and asked if they would like to participate in the study. An information sheet/letter about the study was given or read to them. Those who consented to participate were requested to give a signed consent before being interviewed.

Sample size

A sample size was calculated using the formula, $n = Z^2_{(1-\alpha/2)}pq/d^2$ (where $Z_{(1-\alpha/2)} = 1.96$ at 95% confidence (or 5% α error probability [type 1]); p = proportion of patients concurrently utilizing antiretroviral treatment with traditional medicine, $q = 1-p$; d = absolute allowable error (precision around the proportion you are wanting to estimate i.e. how wide the 95% confidence interval. For this study, if we assume maximum variability, hence $p = 0.5$; $q = 0.5$ with a desired precision (*d)* ±5%). A minimum sample size of 384 was calculated. To maintain this precision across geotypes (rural and urban) strata and to detect at least 10% difference in concurrent traditional medicines utilisation and prescribed antiretroviral therapy, the final total required sample size is 384*2=768 irrespective of gender (Schork and Williams, 1980; Machin et al., 1997).

Data collection technique and instruments

A semi-structured questionnaire with mixed close-ended and open-ended questions was used to assess the rate of traditional medicine utilisation prior to and after patients had joined a formal antiretroviral programme. The questionnaire contained three sections: section A referred to socio-demographic characteristics of respondents; section B referred to clinical information about the prescribed antiretroviral treatment and other medications; and section C was used to assess traditional medicine utilisation before and after joining the antiretroviral programme. The questionnaire was also readily available in Zulu and was administered by the researchers using interview techniques.

Data analysis

Descriptive statistics including frequency and percentage were used to analyse collected data. Where applicable, categorical data were presented in the form of tables and graphs. The

association between variables and use of traditional medicine was estimated using Pearson Chi-squared tests. A P value ≤0.05 was estimated to be statistically significant.

Ethical considerations

This study was approved under ethical clearance certificate number: approved this study: SHSEC 012/14. No contact with public health facilities or patients was made prior to obtaining ethical clearance (certificate) from the University of KwaZulu-Natal and permission from relevant gate keepers (KwaZulu-Natal department of health, district health authorities and health facility managers) to enter the premises of health facilities. Prior consent from the KwaZulu-Natal Department of Health, district health managers, health facility Managers and patients was obtained. Health care professionals caring for the study participants were informed about the study.

Study participants were informed about the study. Those willing to participate were given an information sheet and requested to sign an informed consent form, also available in Zulu When permission was granted, a structured questionnaire was administered. No names and identity of participants appeared on any consent form, but only a signature and a coded identification known to the researchers and the supervisor. No patients were included in this research study without their prior signed consent form.

Results

Response rate

The estimated sample size population was 768 patients, but due to logistic difficulties, a final sample of 686 patients was enrolled in this study, a response rate of 89.30%.

Socio-demographic characteristics of respondents

The majority of the respondents were female (493, 72%). Respondents were Black African (645, 94%), 25 (3.64%) were Colored and 15 (2.19%) were Indian / Asian. (Table 1).

Table 1: Distribution of Racial Groups among male and female population

	Males	Females	**Total**
Black African	175	471	645
Colored	12	13	25
Indian/Asian	6	9	15
Total	193	493	686

Use of traditional medicine before and after joining the ARV programme

Figure 1 illustrates the number of respondents who used TM before and after ART. Overall, 188 respondents (188/686, 27.40%) indicated to have used traditional medicine before starting with antiretroviral medicines while 24 respondents (24/686, 3.50%) reported ongoing use of traditional medicine while on antiretroviral therapy, $p<0.05$. A stratified analysis by sex showed that a high proportion of females (131/686, 19.09%) than males (57/686, 8.3%) used TM before starting with ART. There was a reduction in the use of traditional medicine after starting with antiretroviral medicines amongst both females (16/686, 2.33%) and males (8/686, 1.17%) after ART ($p <0.05$).

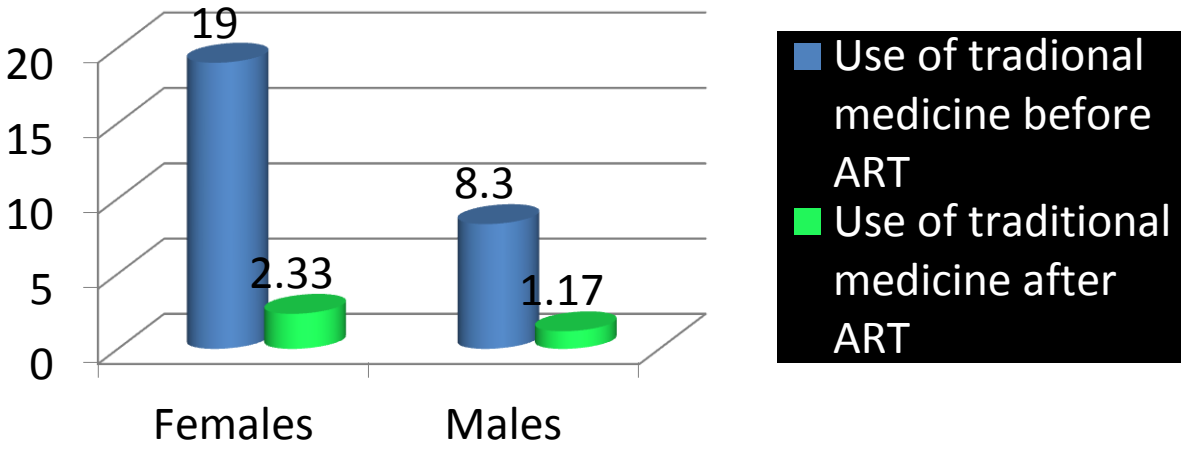

Figure 1: TM ultilisation prior to and post ARV therapy. Legend: ART=antirertoviral therapy

Use of TM for other diseases and HIV infection

Table 2 presents the frequency of other illnesses and the use of traditional medicine after starting with ART. Respondents were asked if they used TM for the treatment of HIV condition or other illnesses. 143 out of 686 participants (143/686, 20.85%) reported having other diseases besides HIV infection (Table 2). Among those 24 respondents who reported ongoing use of traditional medicine while on ART, 16 out of 24 used TM for HIV infection alone while the other 8 had HIV and other conditions such as hypertension (4/24), tuberculosis (2/24), diabetes (1/24) and hypertension and diabetes (1/24).

Table 2: Cross-tabulation between other illness and use of TM after ART

OTHER ILLNESS		Use of TM AFTER ART		Total
		No	Yes	
1	No other illness reported besides HIV	527	16	543
2.	Hypertension alone	43	4	47
3	Tuberculosis(TB)	26	2	28
4.	Missing	20	0	20
6	Diabetes	13	1	14
7	Epilepsy	11	0	11
8	Asthma	7	0	7
9	Arthritis	4	0	4
10	Hypertension & Diabetes	4	1	5
11.	Hypertension & Tuberculosis	2	0	2
12	Arthritis & hypertension	1	0	1
13	Cancer	1	0	1
14	Hypertension, diabetes, heart disease	1	0	1
15	Psychiatric condition	1	0	1
16	Ulcers	1	0	1
Total		662	24	686

Use of TM and self-reported side effects associated with antiretroviral medicines

Table 3 presents the frequency of self-reported side effects associated with antiretroviral medicines. 147 out of 686 respondents (21.43%) reported having side effects related to antiretroviral medicines. Respondents were asked if they used TM for the management of

side effects due to antiretroviral medicines. An association between side-effects and use of TM showed that half of those respondents on ongoing use of traditional medicine (12/24) had reported no side-effects while the remainder had conditions such as nausea (3/24), body wasting and weight loss (2/24), dizziness (2/24), rash (2/24), diarrhea (1/24), leg pain (1/24) and stroke (1/24), p <0.001.

Table 3: Association between self-reported side effects and use of TM by respondents

Type of side-effect		Use of TM AFTER ART		Total
		No	Yes	
1	No side-effects reported	527	12	539
2	Rash	35	2	37
3	Body wasting/weight loss	8	2	10
4	Fatigue	6	0	6
5	Headache	5	0	5
6	Dizziness	5	2	7
7	Vomiting	5	0	5
8	Diarrhea	5	1	6
9	Rash/headache	3	0	3
10	Nausea & vomiting	3	0	3
11	Ring worms	3	0	3
12	Swollen feet	2	0	2
13	Big tummy	2	0	2
14	Boils	2	0	2
15	Erectile dysfunction	2	0	2
16	Headaches, vomiting	2	0	2
17	Insomnia	2	0	2
18	Leg and body pain	2	0	2
19	Nausea	2	3	5
20	Stomach pain	2	0	2
21	Stomach pain	2	0	2
22	Weight loss & loss of memory	1	0	1
23	Abscess on stomach	1	0	1
24	Abscess on stomach, weight loss, cough	1	0	1
25	Angina	1	0	1
26	Asthma, gout	1	0	1
27	Back pain	1	0	1
28	Bad dreams	1	0	1
30	Bloated	1	0	1
31	Raised blood pressure	1	0	1

32	Breast enlargement	1	0	1
33	Candidiasis	1	0	1
34	Coughing	1	0	1
35	Diarrhea, vomiting	1	0	1
36	Dizziness, shivering, skin rash, insomnia	1	0	1
37	Drowsiness	1	0	1
38	Eczema	1	0	1
39	Fat distribution	1	0	1
40	Headache, painful feet	1	0	1
41	Headaches, neck pain, joint pain	1	0	1
42	Itchy arms, red eyes	1	0	1
43	Leg pain	1	1	2
44	Leg pain, swelling	1	0	1
45	Leg stiffness, sleepy	1	0	1
46	Leg stiffness, sleepy, dizziness	1	0	1
47	Marks on her neck	1	0	1
48	Mood swings	1	0	1
49	Nausea, headaches	1	0	1
50	Pain and swelling on the left leg	1	0	1
51	Pain under her foot	1	0	1
52	Painful feet	1	0	1
53	Pins and needles in feet	1	0	1
54	Rash/red eyes	1	0	1
55	Renal dysfunction	1	0	1
56	Spots on body	1	0	1
57	Stroke	0	1	1
58	Sweating	1	0	1
59	Swollen feet & hands	1	0	1
60	Swollen leg	1	0	1
61	Visual disturbances	1	0	1
62	Weakened eyesight	1	0	1
Total		662	24	686

Healthcare workers' reactions to the concurrent use of traditional medicine and antiretroviral medicines

With regard to the proportion of respondents about reactions of healthcare workers on the concurrent use of TM and antiretroviral medicines, most respondents (253/686, 36.88%) reported that counselors told them not to use TM concurrently with their antiretroviral medicines. In follow up visits, 249 out of 253 respondents (170 females and 79 males)

reported to have a negative reaction from their health care workers (Doctors, Nurses, Pharmacists and Counselors) about the concurrent use of TM with antiretroviral medicines.

Perceptions of respondents on ART and other reasons for use of TM

Almost all respondents in this study (681/686, 99.27%) believed that ART had helped them; they reported to have a decreased viral load, an increased CD4 and an improvement in their quality of life as they took their medication from month to month. In a follow-up question about other major reasons for using TM, the majority of respondents (671/686, 97.8%) stated that there were no reasons for using TM for HIV condition while a few participants stated having other reasons(8/686, 1.2%), cultural beliefs (6/686, 0.8%) and ARVs side-effects for using TM, $p<0.001$. A few participants (37/686, 5.4%) stated that traditional healers should be given a chance to help find a cure for HIV infection.

Discussion

This study found that many more female respondents than their male counterparts reported using TM in a stratified analysis by sex. This finding can be justified by a large number of black African females (71.9%) taking ART compared to black African males because more females attended the clinics for their medication and more females are infected with HIV as compared to males (Statistics South Africa, 2013, Statistical Release P0302, Midyear Population estimates 2013).

This study found that respondents reported a reduction in the use of TM from 188 respondents (188/686, 27.40%) before ART to 24 respondents (24/686, 3.50%) on ongoing use after joining antiretroviral programmes. This finding indicates a low usage of TM compared to other studies among HIV infected patients in South Africa (Peltzer et al., 2009; Babb et al., 2007). However, the findings of this study are in contradiction with a worldwide increase in the use of traditional medicine as stated by Peltzer et al., (2009). It is interesting to note that patients reported that counselors at ARV clinics told them not to use TM concurrently with their antiretroviral medicines. Moreover, healthcare care workers also expressed negative reactions about the concurrent use of antiretroviral medicines with TM in follow-up visits. Such an attitude may be a barrier to patients disclosing their use of other medications and treatment practices to modern healthcare providers. Yet, it is documented

that some allopathic medical providers viewed TM as nothing much than a combination of mixtures ingested or applied topically to alleviate illness or ailments; a view not founded on facts (Belisle et al., 2014).

This study found that respondents on ongoing use of traditional medicine after starting with ART also reported having amongst other diseases such as hypertension (4/24), tuberculosis (2/24), diabetes (1/24) and hypertension and diabetes (1/24), besides HIV infection alone (16/24). Chronic diseases have been identified in another study as one of the major reasons for the use of traditional medicine in the general population in northern Tanzania (Stanifer et al, 2015). Besides co-morbidities, it has been reported that patients ruse traditional medicines to treat ART related side effects. This finding is in agreement with another study, which found some "anecdotal evidence from South Africa" suggesting that a number of ART patients resorted to traditional medicine after experiencing side effects from ART (Peltzer et al., 2008). Finally, the finding that some respondents (37/686, 5.4%) stated that traditional healers should be given a chance to help find a cure for HIV infection is in contrast to the views by some authors that the belief system that is enticing the use of traditional medicines and religious prophets may have a negative impact on the wellness of people living with HIV infection (Michel and Matlakala, 2013).

The above findings should be considered bearing in mind the following limitations of this study. The findings of the study cannot be generalized to the entire population of South Africa. In addition, except for black participants, other participants from other racial groups found in South Africa were not represented correctly in this study. The extent of the use of traditional medicine might not be fully disclosed by HIV infected patients. Further studies are needed to clarify whether there is a transparent communication between healthcare workers and patients to the extent of freely disclosing any health seeking behaviour outside the main healthcare stream.

Conclusion

Although about twenty-seven percent of respondents (188/686, 27.40%) indicated to have used traditional medicine before they started anti-retroviral treatment, a drastic reduction was noted in the use of traditional medicine by HIV infected patients after joining antiretroviral programmes as less than four percent of respondents (24/686, 3.50%) reported ongoing use of

traditional medicine ($p<0.05$). Interestingly, over a third of respondents (253/686, 36.9%) indicated that their healthcare worker advised them against the concurrent use of traditional medicine with antiretroviral medicines. This finding suggests that patients may be implementing the advice given to them by their health care providers. Further research is recommended to investigate the rationale and barriers that prevent patients from disclosing the use of African traditional medicines to their healthcare providers.

Acknowledgements

The authors would like to extend would like to extend their utmost gratitude and appreciation to The KwaZulu-Natal Provincial Department of Health, the district office at uThukela and eThekwini, KwaZulu-Natal and all the sites that granted permission to conduct this study.

References

Avert report. (2012).South Africa HIV & AIDS Statistics. Available at http://www.avert.org/SouthAfrica-hiv-aids-statistics.htm#top.Accessed on 24th May 2013.

Awodele *et al*. (2012). Use of complementary medicine amongst patients on antiretroviral drugs in an HIV treatment centre in Lagos, Nigeria. Curr Drug Saf, Apr 7(2):120-5. Available on PubMed. Accessed on the 25th July 2013.

Bains *et al*. (2013). Molecular diversity and population structure at the cytochrome P450 3A

Gene in Africa. BMC Genetics; 14:34.

Belisle HA., Hennik M., Ordonez CE, John S., Ngubane-joye, Hampton J, Sunpath H., Preston-Whyte E and Marconi VC. Concurrent use of traditional medicine and ART: Perspectives of patients, providers and traditional healers in Durban, South Africa. Global Public health , 10:1, 71-87, DOI: 10.1080/17441692.2014.9677.09

Bodeker *et al*. (2005). Global atlas of traditional, complementary and alternative medicine. Kobe 2005.Accessed on the 10th October 2013.

Burger *et al.* (2010).*The costs of illiteracy in South Africa.* Available: http://ideas.repec.org/p/sza/wpaper/wpapers113.html . Accessed on the 1st September 2013.

Chigwede *et al.* (2008). Estimating the lost benefits of antiretroviral Drug use in South Africa. Jacquir Immune Deficiency Syndrome. Volume 49, number 4, 1 December. Accessed on the 6th August 2013.

Education and Training Unit (ETU). (2007). *HIV and AIDS and Municipalities.* Available at http://www.etu.org.za/toolbox/docs/localgov/municipalities.html.Accessed on the 1st September 2013.

Francois Venter. (2012).HIV Treatment in South Africa: The challenges of an increasingly successful antiretroviral programme in South African Health Review 20122/2013. Published by Health Trust Systems. March 2013. Accessed on the 6th August 2013.

Joint United Nations Programme on HIV/AIDS. (2012). UNAIDS World AIDS Day Report 2012- Results *2012. UNAIDS. Geneva,* pages 6-7. Available at http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2012/gr2012/JC2434_WorldAIDSday_results_en.pdf.Accessed on 24th April 2013.

Liverpool *et al*. (2004). Western Medicine and Traditional Healers: Partners in the Fight against HIV/AIDS. *Journal of the National Medical Association*. Vol. 96. Number 6, pages 822-825. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2568353/pdf/jnma00175-0094.pdf. Accessed on the 20th October 2013

Mbatha *et al*. (2012). Sick certificates issued by South African traditional health practitioners: Current legislation, challenges and the way forward. South African Medical Journal, Vol 102, No39.

Michel J. and Matlaka MC. The challenges experienced by nongovernmental organisations with regard to the roll-out of antiretroviral therapy in KwaZulu-Natal. S Afr Fam Pract 2013;55(3):264-269.

Mokaila A. (2001) – Traditional medicine vs. Western medicine. http://www.academia.edu/4793261/Honoring_the_Afrikan_Traditional_Herbalist_-_Traditional_Medicine. Accessed on the 24 March 2014

Molly Meri Robinson and Xiaorui Zhang. World Health Organization, World Medicines Situation. Traditional medicines: Global situation, issues and challenges. Geneva 2011.

Namuddu *et* al. (2011). Prevalence and factors associated with traditional herbal medicine use among patients on highly active antiretroviral therapy in Uganda. BMC public Health. Nov 10; 11:855. Available on PubMed. Accessed on the 25th July 2013.

Peltzer K. (2009).Utilization and practice of Traditional/Complementary/Alternative Medicine (TM/CAM) in South Africa. African Journal of traditional, Complementary and Alternative Medicines (AJTCAM). 6(2):175-185. Available online on PubMed. Accessed on the 13th May 2013.

Peltzer *et al*. (2008). Use of traditional, complementary and alternative medicine for HIV patients in KwaZulu, South Africa. BMC Public Health, 8: 255. Available at http://www.biomedcentral.com/1471-2458/8/255. Accessed on the 20th March 2014.

Stanifer JW, Patel UD, Karia F, Thielman N, Maro V, Shimbi D, et al. (2015) The Determinants of Traditional Medicine Use in Northern Tanzania: A Mixed-Methods Study. PLoS ONE 10(4): e0122638. https://doi.org/10.1371/journal.pone.0122638

Statistics South Africa. (2013). Statistical Release P0302, Midyear Population estimates 2013. Available: http://www.statssa.gov.za/publications/P0302/P03022013.pdf. Accessed on the 1st September 2013

Stats SA, Mid-year population estimates. (2011). Statistics SA: statistical release P0302 Mid-year Estimates. Available at http://www.statsa.gov.za/local copy/indicators/stats SA/2011 mid-year estimates. Accessed on the 22nd August 2013.

World Health Organisation (WHO). (2008). 'Traditional Medicine'. Available at http://www.who.int.mediacentre/factsheets/fs134/en/index.html.Accessed on the 6th August 2013.