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Full Length Research Paper

Basic sociological concepts, attitude, perception and effects on propagating the message of HIV and AIDS prevention and control on engineering student of some selected tertiary institutions in Ekiti State, Nigeria

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Accepted 7 November, 2013

This study centres on the basic sociological concepts, attitudes, perception and its effects on propagating the message of the dreaded disease called human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) prevention and control using engineering student from selected tertiary institution in Ado-Ekiti, Ekiti State, Nigeria. HIV and AIDS prevention was examined prior and after HIV and AIDS education programme. It was discovered that majority of the students were aware of this deadly disease, but larger proportion of this class of students did not believe in necessity for the propagating the message of HIV and AIDS prevention due to either misconception or lack of proper awareness about the virus. This study revealed that HIV and AIDS education is essential to correct the students' opinion, attitudes and perception about propagating the message of its prevention. The students' levels of academic and awareness about the disease are also significant factors that could enhance their willingness to participate in propagating the message.

Key words: Attitude, perception, propagation, human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), control.

INTRODUCTION

There is no doubt about the reality that human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) are real in Nigeria. Everyone is fully aware of the pandemic nature of the scourge; HIV infection is known to affect virtually all the organs in the body causing different metabolic derangements in addition to depression of the immune system (Olubomehin and Balogun, 2005). Such metabolic abnormalities are also accompanied with body fat redistribution (Martinez and Gatell, 1999). According to the Global Burden of

the Global Burden of Disease (2004) Update, organised by World Health Organisation in 2008, it was revealed that AIDS will remain one of the ten leading causes of death globally (Keele, 2006). It is estimated that since the beginning of the epidemic, more than 15 million Africans have died from AIDS (UNAIDS/WHO, 2007). In this context, it becomes possible to understand the massive impact that the AIDS epidemic has had on families, institutions, communities, workplaces, national and regional development in Africa.

As noted by the World Watch Institute (2007), the HIV epidemic raging across Sub-Saharan Africa is a tragedy of epic proportion. It is not only a health but also a development crisis; one that is altering the region's demographic future, reducing life expectancy, raising mortality, lowering fertility, creating an excess of men over women and leaving millions of orphans in its wake (Koffi, 2000). According to Oladele et al. (2008), Sub-Saharan Africa is home to 70% of adults and children living with HIV and AIDS in the world today. According to Joint United Nations Programme on HIV/AIDS (UNAIDS) (2013) report on the global AIDS epidemic, it was estimated that 35.3 (32.2 to 38.8) million people were living with HIV in 2012.

It was made known that about 15,000 people throughout the world become infected with HIV every day and 60% of these people are women and men aged between 15 and 24 years (Williams et al., 1997). In many developing countries which Nigeria is included, data have shown that up to 60% of all new HIV infections are among 15 to 24 years old with females out-numbering males in the ratio of 2 to 1 (Adedoyin and Adegoke, 1995).

Globally, women comprise 52% of all people living with HIV in low- and middle-income countries, and men 48%. However, in sub-Saharan Africa, the centre of the global epidemic, women still account for approximately 57% of all people living with HIV (UNAIDS, 2013).

The recent statistics from Nigeria Red Cross Society, Natural Resources Conservation Service (NRCS) (2004) show that over four million Nigerians are already living with the virus. Interestingly, most infected people with HIV are student of tertiary institutions. Through the epidemiological survey carried out by Youth Action Rangers of Nigeria, YARN (2004), it was discovered that 60% of those living with HIV infection in Nigeria are within the ages of 10 and 24 years. Akande (1999) also observed that over 85% of those infected are aged between 20 and 59 years. The larger number of Nigerian students falls within the age ranges mentioned. The rapid rate of HIV infection among this class of age is as result of the ways most students live reckless life. Most of them are sexually active before marriage. The contraceptive or condom use among youths, especially students is generally low. Moreover, the adoptions of western culture that erodes traditional African values, which places emphasis on chastity have a more permissive attitude to increased activity among Nigerian youths, especially the students. With young people getting infected and affected by HIV, hopes for the future seem very bleak (Heard, 2004).

According to Mongkuo et al. (2010), most college students are knowledgeable about HIV transmission routes and protection methods, but this knowledge rarely deters them from engaging in risky sexual practice.

Moreover, the students tend to believe that they are of low risk for contracting the disease. To develop effective education and prevention strategies, a number of scholars have proposed that research should focus on college campuses (Mattson, 2002; Opt et al., 2007). Other scholars have suggested the need to extend this research effort to include comparative studies of college students in various institutional settings, such as private versus public colleges, religious versus secular, 2-year versus 4-year and commuter versus residential institutions (Lewis and Malow, 1997; Opt et al., 2007).

Most young people in Nigeria may lack basic information about sexually transmitted diseases, most especially HIV and AIDS. The rate of awareness about HIV and AIDS gets increases daily through propagation of the messages on radio, television and printing media like newspapers, leaflets etc. Meanwhile, increase in the rate of awareness about HIV and AIDS is still needed urgently to break the stigma attached to HIV and AIDS by Africans, especially in Nigeria. This could be achieved by synthesising efforts on HIV and AIDS education among the youths, especially the students. This needs to be accomplished with making these students to have access to information and skills required to reduce their vulnerability to HIV infection. In Nigeria, like most other African countries, preventive interventions are carried out through public enlightenment campaigns. The Federal government through the National Action Committee against AIDS (NACA), in collaboration with UNICEF has continued public enlightenment programmes to check the spread of AIDS. NACA in collaboration with the Society for Family Health with the support from USAID has supported messages on radio and TV, focusing on how to avoid HIV infection through abstinence, mutual fidelity and the use of condoms (Tumushabe, 2006). Similarly, in Uganda, the government launched an extensive AIDS education campaign in the 1990s which cut HIV prevalence rates in that country from an estimated 14% to approximately 8% in 2000 (Nolen, 2007).

With the background in mind, a study on engineering student in tertiary institution responses was conducted to investigate whether or not HIV and AIDS education is effective in improving the attitudes and perception of engineering students in tertiary institutions on propagating the message of HIV and AIDS prevention and control. Special reference was paid to engineering students in two tertiary institutions in Ado-Ekiti, Ekiti State, Nigeria.

MATERIALS AND METHODS

An intervention study was carried out among selected students studying engineering in two tertiary institutions in Ekiti State, Nigeria. Proportionate sampling technique was used in selection of 300 students across the selected schools of higher learning.

Table 1. Age and sex distribution of the respondents.

Age (years)	Male	Female	Total
16 – 40	160	130	290

p-value = 0.078.

Population of the study

The population of this study was made up of engineering students from two tertiary institutions in Ekiti state.

Study sample

One hundred and fifty students were randomly drawn from each of the tertiary institutions. The selected students include 150 students from School of Engineering, Federal Polytechnic, Ado-Ekiti, and 150 students from Faculty of Engineering, Ekiti State University.

Instrumentation

Structured questionnaire was designed to gather information on the views and opinions of the selected students on their willingness to propagate the message of HIV and AIDS prevention and control. The selected students were later tutored for two weeks what HIV and AIDS is, mode of its infection/transmission, general impacts, possible methods of preventing and controlling the spread of HIV and AIDS. Post-test questionnaire was designed to determine whether or not the tutored students have accepted and are willing to participate in propagating the message of HIV and AIDS prevention and control. Self-administered pre-test and post-test questionnaires were administered to the selected students in their respective schools. All returned questionnaires were validated, 290 out of 300 questionnaires distributed were returned. The data collected both for pre-test and post-test were analysed using WINKS SDA Statistical software. The relationships were analyzed by performing cross-tabulation and chi-square test. A five percent level of p-value was used as a guideline for determining the significance of the relationships, when the value of $p > 0.05$, there is no significant relationship and when $p \leq 0.05$, there is some significant relationship between a particular variable and willingness to participate in the propagation of the message of HIV and AIDS prevention.

RESULTS

There is no significant relationship between age and sex. Table 1 shows the value of $p > 0.05$.

DISCUSSION OF RESULTS

It was observed from Table 1 that males constitute 55.2% of the respondents, while the rest 44.8% are females. The chi-square test ($p < 0.001$) shows that there is a statistically significant positive relationship between the respondents' age group and willingness to participate in the propagation of the message of HIV and AIDS

prevention.

The effect of sex on the opinion of the respondent's comparison with the necessity for propagating the message of HIV and AIDS prevention and control were tested before and after the education programme. It was revealed in Table 2 that before the teaching on HIV and AIDS, 34.8% of male and 28.6% of female respondents did not believe in the necessity for propagating the message of HIV and AIDS prevention, while 15.5% of male and 14.8% of female respondents cherished the necessity for propagating the message. Interestingly, 0.3% of male and 1.7% of female respondents remain indifferent to the propagating activity. In Table 3 the chi-square test ($p = 0$) indicates that there is no significant relationship between the genders' opinion and willingness to participate in the propagation of the message of HIV and AIDS prevention. But, the result of the test carried out after the teaching on HIV and AIDS revealed that 96.8% of male and 87.1% of female respondents believed in the necessity for propagation of the message, while 2.5% of male and 9.1% of female respondents claimed that it is not necessary to propagate the HIV and AIDS message, and 0.6% of male and 3.8% of female respondents seemed to be unconcerned about the activity at all. The chi-square test ($p = 0.008$) indicates that there is a significant relationship between the genders' opinion and willingness to participate in the propagation of the message.

It was discovered that before the HIV and AIDS education programme, 69.7% of respondents did not agree that propagating the message of HIV and AIDS prevention is necessary while about 30.3% of respondents agreed that propagating the message of HIV and AIDS prevention is necessary. But it was revealed after the HIV and AIDS education programmes in the selected schools that 95.9% of the respondents agreed and 4.1% of the respondents did not agree that propagating the message of HIV and AIDS prevention is necessary. The values of the chi-square tests before and after the education programme were both equal to $p < 0.001$ which indicates that there is a significant relationship between the respondents' opinion on the necessity for propagating the message and willingness to participate in the propagation of the message.

In Table 4 the effect of sex on the opinion of the respondents' comparison with the willingness to participate in the propagating of the message of HIV and AIDS prevention and control were also gauged before and after the education programme. It was found before the education programme that, 77.8% of male and 75.0% of female respondents showed their unwillingness to participate in the propagation, while 8.9% of male and 4.5% of female declared their willingness to participate in the propagation, and only about 13.3% of male and 20.5% of female respondent remained neutral. The chi-

Table 2. Cross tabulation to determine the effect of sex on the opinion of the respondents for necessity for propagating the message of HIV prevention and control before and after HIV and AIDS education programme.

Sex	Pre-test result				Post-test result			
	No	Yes	Don't know	Total	No	Yes	Don't know	Total
Male	101	45	10	156	04	153	01	154
Female	83	43	08	134	12	115	05	136

Pre test result p-value = 0.196; post test result p-value = 0.291

Table 3. Respondents' opinion on the necessity for propagating the message of HIV prevention in relation to their willingness to participate in the propagation of the message before and after HIV and AIDS education programme.

Agreed that propagating the message of HIV and AIDS prevention is necessary	Willingness to participate in the propagation of the message of HIV and AIDS prevention					
	Pre-test result			Post-test result		
	No	Yes	Total	No	Yes	Total
No	175	27	202	09	02	11
Yes	53	35	88	21	235	256

Pre test result p-value ≈ 0; Pre test result p-value ≈ 0

Table 4. Cross tabulation to determine the effect of sex on the opinion of the respondents for their willingness to participate in propagating the message of HIV prevention and control before and after HIV and AIDS education programme.

Sex	Pre-test result				Post-test result			
	No	Yes	Don't know	Total	No	Yes	Don't know	Total
Male	123	14	21	158	34	127	6	167
Female	99	06	27	132	42	55	26	123

Pre test result p-value = 0.127; Pre test result p-value = 0.01.

The chi-square test ($p = 0.127$) shows there is no significant relationship between the genders' opinion and willingness to participate in the propagation of the message. But after the education programme in the selected schools, it was discovered that 76.0% of male and 44.7% of female respondents showed their willingness to participate in the propagation of the message. The chi-square ($p < 0.001$) indicates that there is a significant relationship between the genders' opinion and willingness to participate in the propagation of the message of HIV and AIDS prevention and control.

CONCLUSION AND RECOMMENDATIONS

HIV and AIDS related information should be simplified for the benefit of all students in the tertiary institutions. Propagation of the message of HIV and AIDS prevention needs to be brought to the corridor of the students. This

programme can be done frequently in form of symposium, workshops, debates, seminars, etc to create more awareness and enlighten the students more about the dreaded disease, and more emphasis should always be laid on adverse effects (moral, economic and social effects) of HIV and AIDS in any of the aforementioned recommended gathering and people should always be made to realise that "prevention is better and less costly than cure".

Teaching of HIV and AIDS should be incorporated into the school curriculum, even in all human activities, to create more awareness about the infection among the students. More so, this will assist in making the students to realise the importance of the infection better and the need for integration of HIV prevention into all human activities. Counselling unit on HIV and AIDS needs to be established in all tertiary institutions. This 'unit will assist greatly to enhance students' acceptance of HIV and AIDS and their willingness to participate in propagating the

message of HIV prevention. Governments, philanthropists and international communities need to assist financially in alleviating poverty in Nigeria to avoid students being pushed to compulsory professional prostitution, and other form of immoral activities that can cause HIV infection. Also, governments, philanthropists, NGOs and international communities also need to assist in making available necessary materials for effective propagation of the message of HIV prevention.

The statistics of HIV and AIDS infection in the country should always be analysed and made public to convince people against the misconception that HIV and AIDS is a taboo or western propaganda. Instilling fear about HIV and AIDS should be discouraged as it could only be effective for a short time (that is, counterproductive) and should be replaced with the message of hope that something could still be done to eliminate the virus in our society through propagation of the message of prevention. People need to challenge the myths and misconceptions about human sexuality that translate into dangerous sexual practices.

Work and legislation is needed to reduce prejudice felt by HIV+ people around the world and the discrimination that prevents people from "coming out" as being HIV positive. HIV prevention initiatives need to be increased, people across the world need to be made aware of the dangers, the risks, and the ways they can protect themselves.

HIV and AIDS education plays significant role in influencing the decision of people, especially students positively towards acceptance of HIV and AIDS as real necessity for elimination of the virus in society and their active involvement in propagating the message of HIV prevention. Young women and men, especially the students are at high risk of getting infected with HIV. Therefore, it is essential that this class of people, need to be fully involved whether in training as a group or individual, or through any other significant means in propagating the message of HIV prevention.

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Full Length Research Paper

Factors associated with the development of HIV associated lipodystrophy in patients on long-term HAART

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Highly active antiretroviral therapy is effective in reducing viral load and increasing survival in HIV-1 infected patients. It consists of two nucleoside reverse transcriptase inhibitors and a protease inhibitor or two nucleoside reverse transcriptase inhibitors and a non-nucleoside reverse transcriptase inhibitor. The efficacy of Highly active anti-retroviral therapy (HAART) is however compromised by adverse events such as lipodystrophy in patients on long-term HAART. This study was carried out in 265 HIV-1 seropositive patients treated with HAART for 6 months and longer, in order to correlate patients' age, gender, CD4 counts, WHO stage at initiation of HAART, duration and type of anti-retroviral therapy with development of lipodystrophy. A longer duration of therapy was found to be significantly associated with the development of lipodystrophy with 19 patients (24.7%), 73 patients (60.8%) (OR 2.06; CI 1.21 to 3.51, p value 0.004) and 39 patients (67.2%) (OR 2.34; CI 1.21 to 4.46, p value 0.006) having lipodystrophy at 6 to 18, 18 to 36 and 36 to 72 months of treatment, respectively. The odds of lipodystrophy after HAART for 18 to 36 months and 36 to 72 months was 4.14 ($p < 0.0001$) and 6.179 ($p < 0.0001$) times, respectively, higher than after HAART for 6 to 18 months. There was no association between age, gender, CD4 counts, WHO stage and the development of lipodystrophy.

Key words: Lipodystrophy, immune reconstitution, protease inhibitors, WHO clinical stage, duration of highly active anti-retroviral therapy (HAART).

INTRODUCTION

Lipodystrophy, sometimes referred to as fat redistribution is common in HIV infected adults on antiretroviral therapy for prolonged duration (Saint-Marc et al., 1999). This can lead to both short and long-term suboptimal adherence to antiretroviral regimens due to social stigmatization and low self esteem leading to virological and even clinical failure (Reynolds et al., 2006). The risk of developing lipodystrophy has been linked repeatedly to the use of nucleoside reverse transcriptase inhibitors (NRTIs), especially Stavudine. In the fat re-distribution evaluated by

by computed tomography and metabolic abnormalities in patients on antiretroviral therapy (LIPOCO) study, the use of Stavudine significantly correlated with wasting when compared with the use of Zidovudine (Saint-Marc et al., 2000). In the Fat redistribution and metabolic change (FRAM) analysis, use of the antiretroviral drugs Stavudine or Indinavir was associated with less leg subcutaneous adipose tissue but did not appear to be associated with more visceral adipose tissue accumulation (Bacchetti, 2005).

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Most NRTI-specific adverse effects are thought to be manifestations of mitochondrial toxicity, resulting from inhibition of mitochondria-specific deoxy-ribonucleic acid (DNA) polymerase gamma, the principal enzyme responsible for mitochondrial DNA replication. This ultimately leads to impaired production of adenosine triphosphate. Mitochondrial depletion and dysfunction have been demonstrated in adipose tissue from HIV-infected adults with lipodystrophy (Nolan et al., 2003). Newer NRTI agents Abacavir and Tenofovir have not been associated with lipoatrophy. In fact, improvement in both mitochondrial DNA and complex mitochondrial enzyme activity level as well as in the rate of adipocyte apoptosis, have been demonstrated following removal of the offending NRTIs and replacement with these newer agents (McComsey, 2005).

Protease inhibitor use appears to accelerate the rate of development of NRTI-associated lipoatrophy (Van der Valk et al., 2001). *In vitro*, protease inhibitors have been shown to impair adipose cell differentiation by interfering with the transcription factor sterol regulatory element-binding protein-1 (SREBP-1). Another hypothesis is that protease inhibitors have a high affinity for the catalytic site of HIV-1 protease and may cause apoptosis of peripheral adipocytes by binding and inhibiting a homologous human protein involved in lipid metabolism (Carr et al., 1998). The total period of exposure to HAART appears to be relevant to the onset of lipodystrophy. The majority of cases occur after 3 to 18 months of exposure.

In the Western Australian Cohort Study, the median time from initiation of a PI-containing antiretroviral regimen to clinically apparent peripheral lipoatrophy was 18.5 months for patients receiving Stavudine-containing regimens compared with 26 months for patients receiving Zidovudine-containing regimens (Mallal, 2000). However, combined PI and dual NRTI therapy leads to peripheral lipoatrophy dramatically faster than does dual NRTI therapy alone (Van der Valk et al., 2001; Mallal, 2000).

Older age has consistently been shown to be associated with increased lipodystrophy risk. In the FRAM analysis, age was associated with less leg fat, but more visceral fat, in HIV-infected subjects (Bacchetti, 2005). However body changes occur naturally with ageing. Furthermore, body fat distribution abnormalities have also been reported in HIV-1-infected children. Males appear more likely to develop peripheral lipoatrophy, whereas females have greater central fat accumulation (Saint-Marc, 2000). The clinical stage of HIV infection may play a role in the pathogenesis of lipoatrophy. Decreased CD4 count at initiation of HIV therapy has been associated with self reported lipoatrophy. In the HIV Outpatient Study (HOPS) cohort of 1077 patients, it was reported that the incidence of lipoatrophy was highest among patients who had a prior CD4 count less than 100 cells/ μ L (Lichtenstein et al., 2001). Viral load, duration of HIV infection, prior AIDS diagnosis, immune reconstitution, genetic predisposition and cytokine mediated response (Mynarcik, 2000) have

also been cited as important in some studies.

There are increasing numbers of patients on HAART in Kenya. Stavudine and Zidovudine are the predominantly used first line anti-retroviral therapy, used by over 90% of patients on anti-retroviral therapy. This study aims to document the role of these drugs and their duration of use, patient age, weight, nadir CD4, immune reconstitution and WHO stage at HAART initiation of HAART in the development of lipodystrophy.

MATERIALS AND METHODS

Ethical considerations

The study was conducted after approval by the Department of Clinical Medicine and Therapeutics, University of Nairobi, and the Kenyatta National Hospital Scientific and Ethical Review Committee.

Study site

The study was conducted at the HIV out-patient clinic at Kenyatta National Hospital, a tertiary national referral and teaching hospital in Kenya.

Study population

The participants were HIV-1 positive adult patients on combination HAART as recommended by the National HIV program and defined as either dual NRTI (d4T or zidovudine (AZT) or tenofovir disoproxil fumarate (TDF) with 3TC) with a non-nucleoside reverse transcriptase inhibitors (NNRTI) [Nevirapine (NVP) or Efavirenz (EFV)] or the dual NRTIs with a PI (LPV/r) for 6 to 72 months who attended the HIV clinic between August 2007 and 2008.

Study design

This was a cross-sectional descriptive study. Random sampling was done daily during routine visits until the desired sample size was reached. The minimum sample size required to determine the prevalence of lipodystrophy was determined at 265 patients. The criteria for statistical significance was p value < 0.05 .

Inclusion criteria

HIV-1 positive male and female patients aged 15 years and older on HAART regularly reviewed and compliant with treatment for six months or more were deemed eligible for this study.

Exclusion criteria

Patients on HAART for less than 6 months, patients on anabolic steroids or immuno-modulatory therapy, patients known to have Cushing's disease or other endocrine disorders, pregnancy, moribund patients such as patients with malignancy or HIV wasting syndrome were excluded for this study.

Patient assessment

The Comprehensive Care Centre operates five days in a week. All

Table 1. Demographic characteristics of the study population.

Variable		Number of patients	Mean/%
Age		265	40.69±23.41
Gender	Female	158	59.6%
WHO stage	I	24	8.9%
	II	47	17.3%
	III	99	37.3%
	IV	95	36%
CD4 counts	Nadir	256	119±49
	Most recent	265	335±76.50
Duration of HAART	6-18 months	83	31.2%
	19-36 months	123	46.4%
	>36 months	59	22.4%
HAART combinations	d4T based	188	70.9%
	AZT based	41	15.5%
	TDF based	36	13.6%

marital status, occupation, level of education, WHO clinical staging, current and prior anti-retroviral therapy, physical examination findings and baseline and subsequent laboratory investigations including full blood count, liver and renal function tests, CD4 and CD8 counts are recorded in the patients' charts. Patients deemed eligible for antiretroviral therapy commence treatment and thereafter are given individualized appointments depending on their clinical condition. They also return to the clinic monthly for supply of antiretroviral medication. Recruitment was done among patients who had been on anti-retroviral therapy for more than six months. The patients were informed about the study and their eligibility assessed. Those who met the inclusion criteria and gave signed informed consent were recruited. A study questionnaire was used to collect baseline and clinical data. Lipodystrophy was assessed by patient report and physician examination using a modified version of the lipodystrophy case definition questionnaire (Carr, 2003). Anthropometric measurements (height, weight, mid upper arm circumference, waist circumference and hip circumference) were obtained using a standardized protocol based on the Third National Health and Nutrition Examination Survey.

Outcomes

The outcomes studied for association with development of lipodystrophy included the following: age and gender; WHO clinical stage at diagnosis of HIV with stage I being asymptomatic disease, stage II being minor mucocutaneous infections, stage III being moderate to severe opportunistic infections and stage IV being AIDS defining illnesses; type of HAART used by the patients defined as any combination of at least three drugs from the three classes of anti-retroviral drugs, that is, two Nucleoside analogue reverse-transcriptase inhibitors (NRTIs) and one Non-nucleoside reverse transcriptase inhibitor (NNRTI) or a protease inhibitors (PI); duration of treatment defined as the cumulative duration of treatment of an individual until the recruitment day; baseline/nadir CD4 defined as the lowest level of CD4 counts that has ever been measured; current CD4 defined as the CD4 done at the time of the study.

Statistical analysis

All data was entered into data base using Microsoft excel. Qualitative variables were described in frequencies or percentages and compared between groups using Chi square (χ^2) test. Quantitative variables were described with medians or means and compared between groups using Wilcoxon rank sum test. Cox proportion hazard regression modeling was used to determine variables that predicted the outcomes. Statistical analysis was performed using Statistical Package for Social Sciences, version 15.0. Results were presented in form of tables. The criteria for statistical significance was p value < 0.05

RESULTS

We screened 318 HIV-seropositive patients on chronic HAART and excluded 53 (16.6%) patients; 40 had been on HAART for less than 6 months, five had opportunistic infections, three were moribund, two had HIV wasting syndrome, two declined consent and one had a malignancy. Two hundred and sixty five patients were thus enrolled into the study.

Patients' baseline characteristics

As depicted in Table 1, the mean age of the study population was 40.69 years with 59.6% of the study population being female. Among the study participants, the mean baseline CD4 count was 119/mm³ with a median of 97.5. The study participants achieved immune reconstitution with a median follow-up CD4 of 313 cells/mm³ and a mean of 335/mm³. Majority of the patients, that is 194 (73.3%) were in WHO stage III and IV at initiation of HAART, with only 71 (26.2 %) patients being

Table 2. Factors associated with lipodystrophy in the 265 study participants.

Variable	Prevalence of lipodystrophy (%)	Total	Odds ratio (OR) (95% CI)	p value
Female	88 (55.6)	158		0.083
Male	48 (44.9)	107		
Age (year)				0.415
21-30	10 (37)	27		
31-40	59 (50.9)	116		
41-50	48 (55.2)	87		
>50	16 (45.7)	35		
WHO stage				0.059
I	12 (50)	24		
II	23 (48.9)	47		
III	50 (50.5)	99		
IV	48 (50.5)	95		
HAART duration (months)				0.006
6-18	19 (22.9)	83	0.34 (0.1-0.6)	
18-36	73 (59.3)	123	2.1 (1.2-3.5)	
36-72	39 (66.1)	59	2.3 (1.2-4.6)	
CD4 nadir < 200 (Cell/ μ L)	108 (52.4)	206		0.285
> 200	22 (44)	50		
CD4 Current < 200 (Cell/ μ L)	25 (43)	58		0.150
> 200	104 (53.8)	193		

patients being in stage I and II. The mean duration of treatment of the study participants was 29.7 months with a median of 28 months. One hundred and eighty two patients (68.8%) had been on HAART for longer than 18 months. Only 83 (31.2%) had used HAART for 6 to 18 months. Stavudine based regimens were the most commonly used, with 188 (70.9%) patients being on this combination and 41 (15.5%) patients being on AZT-based regimen. Twenty six of the patients on AZT had switched from a d4T based regimen prior to enrolment into the study. It was also noted that of 36 (13.6%) patients who were on TDF based regimen, 30 had switched from a d4T based regimen and 6 from an AZT based regimen prior to the time of enrolment. Consequently, 244 (92%) of the study participants had used d4T containing regimens during their follow-up in the clinic. The switches were mainly due to drug toxicity (lipodystrophy and peripheral neuropathy) and treatment failure and occurred after 2 to 4 years of treatment.

Gender and lipodystrophy

Approximately fifty-five percent (55.6%) of females and 44.9% of males involved in the study developed lipodystrophy as shown in Table 2. This difference did not

attain statistical significance ($p = 0.083$). Lipodystrophy occurred in similar proportion in both males and females described in 31 males and 30 females. Lipohypertrophy occurred in 16 (76.2%) females and 5 (23.8%) males while mixed syndrome was seen in 45 (78.9%) females and 12 (21.1%) males.

Age and lipodystrophy

Lipodystrophy occurred with equal frequency in all age groups as depicted in the Table 2. There was no significant association between age and lipodystrophy.

WHO clinical stage and lipodystrophy

Lipodystrophy developed in 50.0 % of study participants in WHO stage I, 48.9% of those in stage II, 50.5% of participants in stage III and 50.5% of those in WHO IV as shown in Table 2. There was no significant association between lipodystrophy and WHO stage at initiation of HAART.

Duration of HAART and lipodystrophy

As depicted in Table 2, a longer duration of therapy was

Table 3. Type of HAART used by patients with lipodystrophy.

HAART combination	Prevalence of lipodystrophy (%)	Total	P value
d4T based regimen			
Ever used ¹	128 (52.5)	244	0.144
Never used ²	8 (38.1)	21	
AZT based regimen			
Ever used ¹	21 (51.1)	41	0.748
Never used ²	115 (51.3)	224	
TDF based regimen			
Ever used ¹	33 (91.7)	36	0.000
Never used ²	103 (45)	229	

¹Ever used: patients who have used the regimen in the course of their treatment.

²Never used: patients have never used the regimen in the course of their treatment.

Table 4. Logistic regression model.

HAART duration (months)	Odds ratio	P	95% CI	
18-36	4.14	<0.0001	2.14	8.009
36-72	6.179	<0.0001	2.828	13.5

found to be significantly associated with the development of lipodystrophy with 19 patients (p value 0.000), 73 patients, (OR 2.06; CI 1.21 to 3.51, p value 0.004) and 39 patients (OR 2.34; CI 1.21 to 1.46, p value 0.006) having lipodystrophy at 6 to 18, 18 to 36 and 36 to 72 months of treatment, respectively.

CD4 count and lipodystrophy

A low baseline CD4 count at onset of HAART was not associated with development of lipodystrophy. One hundred and eight (52.4%) patients with baseline CD4 < 200/mm³ developed lipodystrophy compared to 22 patients (44%) with CD4 greater than 200/mm³ (p value 0.285). Likewise, adequate immune reconstitution or failed immune reconstitution was not found to be significantly associated with lipodystrophy. One hundred and four (53.8%) of the patients with current CD4 greater than 200/mm³ developed lipodystrophy compared to 25 patients (43%) with CD4 less than 200/mm³ (p value 0.150) as shown in Table 2.

Type of HAART and lipodystrophy

As shown in Table 3, most of our patients were on a Stavudine based regimens. One hundred and twenty eight (52.5%) of our patients who were on a Stavudine based regimen developed lipodystrophy versus 38.1% of those who had never used a Stavudine based regimen (p value 0.144). The association did not reach significant proportions. Similarly, there was no association between

the use of Zidovudine and development of lipodystrophy (p value 0.748). Interestingly, more than 90% of patients on TDF based regimens, notably with prior exposure to both AZT and d4T, developed lipodystrophy.

Logistic regression analysis

A logistic regression model was constructed, as shown in Table 4, to find which of the associated factors independently predicted lipodystrophy while controlling for the other factors and to quantify this association. The model estimated that for patients who had been on HAART for 18 to 36 months, the odds of lipodystrophy is 4.14 times in those who had been on HAART for 6 to 18 months (p < 0.0001). Similarly, the odds of lipodystrophy is 6.179 times in those who had been on HAART for longer than 36 months compared to those who have been on HAART for 6 to 18 months (p < 0.0001).

DISCUSSION

Lipodystrophy is a well recognized problem in the western world but with very little data in the African population. There is currently no published data on its prevalence and factors associated with its development in Kenya. This study was conducted between August 2007 and 2008 at Kenyatta National Hospital, a tertiary referral and teaching hospital in Kenya. It comprised 59.6% females (female to male ratio 1.5:1). Most of the individuals in the study population were young individuals with a median age of 40 years and about 50% were aged

below 50 years. Females were younger than their male counterparts where 60.7% were below 40 years compared to 44% of males. These findings reflect the National AIDS and STI control programme (NASCOP, Ministry of Health Kenya estimates, 2010) that at least two-thirds of all HIV infected individuals in Kenya are young women. Therefore the age and gender distribution of this study population is fairly representative of the sample of HIV/ AIDS infected patients in Kenya.

Age and gender had no influence on the development of lipodystrophy in our study. The reason for lack of age association in our study could be because majority of the participants were young and therefore not subject to the physiological changes in body fat distribution such as a decrease in limb fat and increased central adiposity that occur normally with aging.

The study participants achieved good immune reconstitution with a median follow-up CD4 of HAART of 313 cells/ml after 6 to 72 months of HAART up from a baseline of 119 cells/ml. The level of baseline CD4 count as well as presence or absence of immune reconstitution was not significantly associated with lipodystrophy in our study. This is in contrast to the HOPS cohort (Lichtenstein et al., 2001) that reported significant association of both baseline and recent CD4 count of less than 100 cells/mm³ with the development of lipodystrophy but similar to findings by Heath et al. (2002) in a prospective population-based study published where neither CD4 levels at entry to study nor change in CD4 count over the follow up period was associated with lipodystrophy development.

Duration of therapy was found to be a predictor of lipodystrophy. Patients who had been on HAART for longer than 18 months were twice as likely to have lipodystrophy than those who had been on therapy for less than 18 months (OR 2.1; CI 1.2 to 3.5 $p = 0.004$). Multivariate analysis showed that prolonged duration of HAART use was an independent predictor of lipodystrophy. These findings are similar to those reported by Mutimura et al. (2007) in Rwanda where the prevalence of lipodystrophy was 69.6% after HAART use for longer than 72 weeks and by Chene et al. (2002) where lipoatrophy was frequent among patients after 30 months of exposure to nucleoside analogues. A long follow up period may therefore be needed in order to identify affected patients.

Eighty six percent (86%) of the patients on HAART were on regimens containing nucleoside reverse transcriptase inhibitor (NRTI) mainly Stavudine-based and Zidovudine-based regimens at the time of enrolment. Slightly over 50% of patients on stavudine-based and zidovudine-based regimens developed lipodystrophy. This suggests that both stavudine and zidovudine are equally associated with the development of lipodystrophy when used for a prolonged duration. In contrast, the LIPOCO study reported that Stavudine significantly correlated with wasting in the Nucleoside Reverse Transcriptase Inhibitor and Protease Inhibitor groups

when compared with the use of zidovudine containing combinations (Saint-Marc et al., 2000). The study showed that more than 20% of our patients had undergone switch therapy at the time of enrolment due to either drug toxicity or treatment failure. This is further demonstrated by the occurrence of lipodystrophy in more than 90% of patients with history of single drug switches. This high rate of switch from first line agents to safer alternatives is an indication that newer antiretroviral agents may be needed in our set-up and is also a reflection on non-reversibility or delayed reversibility of lipodystrophy.

The limitation in this study is that we lacked some data on nadir and most recent CD4 counts on some of our study participants and this may have some effect on our results with reference to the association of CD4 counts with lipodystrophy.

Conclusion

Age, gender, disease stage and immune reserve were not associated with development of lipodystrophy. More than half of the patients on stavudine-based and zidovudine-based regimens developed lipodystrophy and their effect was found to be time-dependent, indicating that long term follow-up is necessary for such patients.

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Full Length Research Paper

Mental health of HIV/AIDS orphans: A review

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Human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) is one of the best known deadly diseases in the world, due to its devastating impact on communities, families, children and development. Worldwide, 34 million people are presently living with HIV/AIDS out of which 17 million are HIV/AIDS orphans. India is the home to the second largest number of HIV/AIDS orphans in the world after South Africa and is expected to become the next epicenter of HIV/AIDS orphan crises. A thorough review of published empirical studies was done. PubMed, PsycINFO databases, online publications of several organizations, web searches and several online journals related to HIV/AIDS were reviewed. Studies related to HIV/AIDS orphans belonging to the age group of 6 to 18 years, who had lost either or both parents to HIV/AIDS or were living with HIV/AIDS infected parents were selected for the purpose of review. Mental health status of HIV/AIDS orphans demands attention because they severely experience negative emotions, behavioral problems, higher levels of psychological difficulties and poor academic performances due to the reasons of being out-of-school, being cared for by a non-parent, inadequate care, child labour, physical abuse, stigma and discrimination. Majorities of the studies found lower level of Perceived Social Support (PSS) of HIV/AIDS orphans. HIV/AIDS orphans need help, we need to know how their mental health is at risk and how to develop prevention and intervention efforts for improving their mental health. Rigorous research is required in this field, so that the programmes and policies makers that are attempting to work for their wellbeing may get helpful information to design evidence based interventions.

Key words: Human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) orphans, mental health, psychological distress, wellbeing.

INTRODUCTION

Human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) is one of the best known deadly diseases in the world, due to its devastating impact on communities, families, children and development. Emerging as a highly ignored issue are children orphaned by this disease (Pandve et al., 2008). Worldwide, 34 million people are presently living with HIV (UNAIDS, 2012) out of which 17 million are HIV/AIDS orphans (United Nations Children's Fund (UNICEF), 2011). India is the home to the second largest number of

HIV/AIDS orphans in the world after South Africa and is expected to become the next epicenter of HIV/AIDS orphan crises. A World Bank estimate suggests that the number of HIV/AIDS orphans in India is approaching 2 million (Sen, 2007). About 50,000 infants are prenatally infected with HIV/AIDS in India annually (National AIDS Control Organization (NACO), 2010). This scenario makes the burden of HIV/AIDS orphans significant and substantial in India. Against this background, the present article aims to review the literature on mental health of

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HIV/AIDS orphans.

Orphanhood has an overall serious negative impact. Children, whose parents have HIV/AIDS infection and/or have died with HIV/AIDS, are impacted medically, socially and economically (Eileen, 2003). They are excluded, discriminated physically and psychologically, distressed and do not get access to basic education and health care. Due to lack of basic caregivers and economical support they are at higher risk of bad health, nutrition, psychological problems, faulty development, juvenile delinquency, drug abuse, school dropout, involvement in risky behaviors and all forms of exploitation like prostitution, beggary, labor and prostitution.

METHODOLOGY

Inclusion criteria

The review focuses on HIV/AIDS orphans belonging to the age group of 6 to 18 years who have lost either or both parents to HIV/AIDS or they are living with HIV/AIDS infected parents. The review is prepared from published empirical studies on HIV/AIDS orphan children and adolescents.

Search strategy and article selection

Published empirical studies were reviewed using a standard review methodology. PubMed, PsycINFO databases and the online publications of several organizations [(the Joint United Nations Programme on HIV/AIDS (UNAIDS), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Children's Fund (UNICEF) and World Health Organization (WHO)] were searched till date for all published articles pertaining to mental health of HIV/AIDS orphans. Web searches (Google, Google Scholar and Yahoo) and several online journals related to HIV/AIDS were reviewed for the same. Excluded articles were those that discussed the mental health of non HIV/AIDS orphans.

RESULTS

The thorough literature search yielded 31 published studies worldwide from 1996 onwards that explored the mental health of HIV/AIDS orphans by assessing the constructs like depression, anxiety, loneliness, traumatic symptoms, self-esteem and hopefulness. The samples, methods and key findings of these studies are summarized in Table 1. Ten studies were conducted in China, six in South Africa, five in Zimbabwe, two in Uganda, Tanzania and Ethiopia and one in Rwanda, Mozambique, USA and Zambia each.

Sample

The sample sizes of reviewed studies related to HIV/AIDS orphans ranged from 30 to 755. The sample were collected randomly from schools, non-governmental organizations (NGOs), government-funded orphanages, orphans living in community-based small group, kinship

care and family based care.

Method and measures used

Out of 31 researches, four researches were longitudinal and 27 were cross-sectional. There was 1 qualitative comparative research, 27 quantitative comparative researches and 1 study used quasi experimental design. 2 researches were both quantitative and qualitative in nature. The methodological variations, use of non-standardized measurement scales and tools, inappropriate control groups, small sample size, use of inappropriate sampling methods and sampling biases of studies makes comparison of findings and drawing general conclusions regarding the mental health of HIV/AIDS orphans difficult. The research methodologies and measures used in the reviewed literature varied from in-depth qualitative interviews to quantitative psychological assessment measures. Reliable, widely used, well-validated standardized measures, adapted existing standardized quantitative scales and newly constructed non-standardized measures have been utilized in the studies till date. This review comprises of comparative quantitative and qualitative researches till date on mental health of HIV/AIDS orphans.

Quantitative studies

Poulter (1996) in Zambia interviewed 22 households with orphans cares, 66 households with HIV-positive parents and 75 control families. The controls were randomly selected from the community, which may also have included HIV-affected families. The Rutter scales (Rutter et al., 1970) was used for caregivers and they reported that orphans were significantly more unhappy or worried than children with HIV-positive parents and both groups were significantly more unhappy, worried, solitary and fearful of new situations than children in non-affected families (no p-values were given). The study found no relationship between psychological disturbance and economic stress and no evidence of conduct disorders and antisocial behavior.

Sengendo and Nambi (1997) interviewed 169 HIV/AIDS orphans and 24 non-orphans in Uganda using systematic random sampling from all eligible sponsored youth. They used a non-standardized 25-item depression scale and interviewed orphans, teachers and some guardians. They found that HIV/AIDS orphans had significantly higher depression scores ($p < 0.05$) and lower optimism about the future than non-orphans ($p < 0.05$). In urban Tanzania, Makame et al. (2002) interviewed 41 HIV/AIDS orphans and 41 non-orphans, using a non-standardized internalizing problems scale based on the Rand Mental Health Inventory (Veit-Wilson, 1998) and items from the Beck Depression Inventory (Beck et al., 1961). They found that HIV/AIDS orphans

Table 1. Studies investigating the Mental Health of HIV/AIDS orphans.

Citation/author/year/ country	Method and design	Sample characteristics	Measures	Main Findings
Cluver et al. (2012). South Africa	Quantitative-comparative study and longitudinal follow-up analysis	269 HIV/AIDS-orphans, 228 non-HIV/AIDS orphans and 180 non-orphans (age 11 to 25 years)	CDI, RCMAS and child PTSD checklist	HIV/AIDS-orphanhood and caregiver HIV/AIDS sickness predicted increased depression, anxiety, and posttraumatic stress symptoms over a 4-year period
Cluver et al. (2012). South Africa	Quantitative-comparative study and longitudinal follow-up analysis	425 HIV/AIDS orphans, 241 non-HIV/AIDS orphans and 278 non-orphans (aged 11 to 25 years)	CDI, RCMAS and child PTSD checklist	HIV/AIDS-orphans showed higher depression, anxiety and PTSD scores than non- HIV/AIDS orphans and non-orphans
Zhao et al. (2011). China.	Quantitative-comparative study and cross-sectional design	579 HIV/AIDS orphans, 383 vulnerable children and 337 non-orphans (aged 6 to 18 years)	Modified PSS-MFMR, CES-DC, and CLS	The strong association between PSS and psychosocial outcomes underscores the importance of adequate social support to alleviate stressful life events and improve psychosocial wellbeing of HIV/AIDS orphans
Getachew et al. (2011). Ethiopia	Quantitative-qualitative-comparative study and cross-sectional design	438 HIV/AIDS orphans and 438 non- HIV/AIDS orphan (age 11 to 18 years)	HADS, RSE and MSPSS	HIV/AIDS and non- HIV/AIDS orphans were having psychological problems. There was no significant difference in prevalence of depression and anxiety between the both groups
Hong et al. (2011). China	Quantitative-comparative study and cross-sectional design	296 HIV/AIDS orphans (aged 6–18 years)	TSCC	HIV/AIDS orphans living in kinship care were significantly distressed followed by those in orphanages and then those in community
Zhao et al. (2010). China	Quantitative-comparative study and cross-sectional design	214 maternal and 225 paternal orphans (aged 6 to 18 years)	TRQ, CES-DC, CLS, TSCC and MPSS	No significant differences were reported between maternal and paternal orphans, except that paternal orphans reported better trusting relationships with caregivers
Zhao et al. (2010). China	Quantitative-comparative study and cross-sectional design	176 double HIV/AIDS orphans (aged 6 to 18 years)	CES-DC, CLS and TSCC	HIV/AIDS orphans who were cared by non-relatives scored highest on depression, traumatic symptoms and loneliness.
Xu et al. (2010). China	Quantitative-comparative study and cross-sectional survey	116 families affected by HIV/AIDS and 109 non-affected families (aged 8 to 17 years)	PedsQL 4.0 generic core scale, SF-36, and RSE	Children in HIV/AIDS affected families were low on psychosocial functioning, emotional functioning and school functioning than non-affected families.
Hong et al. (2010). China	Quantitative-comparative study and cross-sectional study	755 HIV/AIDS orphans, 466 vulnerable children and 404 non-orphans (age 6 to 18 years)	MPSS, CES-DC, CLS, RSE, CFES, HS and PCFS	Vulnerable children reported the lowest level of perceived social support. Perceived social support was associated with positive psychosocial outcomes
Lin et al. (2010). China	Quantitative-comparative study and cross-sectional design	755 HIV/AIDS orphans, 466 Vulnerable children, 404 (age 6 to 18 years)	CES-DC, CLS, RSE, CFES, HS and PCFS	HIV/AIDS orphans reported higher stigmatization than other children. Increased stigma is associated with high psychopathology and lower self esteem, hopefulness, future expectations
Nyamukapa et al. (2010). Zimbabwe	Quantitative - qualitative comparative study and cross-sectional design	185 double orphans, 109 maternal orphans, 150 paternal orphans, 83 non-orphans (aged 12 years and below)	Depression and anxiety scales adapted from WHO self-report questionnaire and 14 group discussions with children	HIV/AIDS orphans were significantly higher on psychological distress than non-orphans. Girls and younger children reported significantly high psychological distress. Paternal and double orphans were worse affected psychologically
Zhang et al. (2009). China	Quantitative-comparative study and cross-sectional survey	755 HIV/AIDS orphans and 466 vulnerable children (age 6 to 18 years)	LITE-S, CES-DC, CLS, RSE, CFES, HS, PCFS, CES-DC, CLS and SES	HIV/AIDS orphans expressed significantly high future expectation, hopefulness, perceived control over the future than vulnerable children. HIV/AIDS orphans were higher on depression and lower loneliness compared to vulnerable children
Xu et al. (2009). China	Qualitative-comparative study and cross-sectional study	16 interviews were conducted with children (aged 8–17 years)	The study collected qualitative data using semi-structured interview	All children relied heavily on caregivers and peers to gain psychological support. Children's psychosocial problems included fear, anxiety, grief, loss of self-esteem and confidence. Stigma towards children existed including isolation, ignorance and rejection

Table 1. Contd.

Kuzinger et al. (2008). Tanzania and Burkina Faso	Quantitative-comparative study and cross-sectional survey	11392 caregivers of HIV/AIDS orphans (4931 in Tanzania, 4835 in Burkina Faso) and 1626 non-orphans (aged 6-11 years, 12-18 years)	Mapping exercise, school enrollment and proper level	No significant difference was observed in Tanzania between HIV/AIDS orphans and non orphans regarding school enrollment or school delay. In Burkina Faso HIV/AIDS orphans significantly were more likely not to attend school than non-orphans
Chitiyo et al. (2008). Zimbabwe	Quantitative-comparative study and cross-sectional study	20 HIV/ AIDS orphans (aged 10 to14 years)	REPSI and PSS scale	Providing Psychosocial support for a period of eight months resulted in improvements in several areas including schoolwork during and after the intervention period
Cluver et al. (2008). South Africa	Quantitative-comparative study and cross-sectional study	425 HIV/AIDS orphans, 241 non-AIDS orphans and 278 non-orphans (age 10 to 19 years)	CDI, RCMA, SDQ and Child PTSD checklist	HIV/AIDS orphans had more psychological problems including anxiety, depression, peer problems, post-traumatic stress and conduct problems
Nyamukapa et al. (2008). Zimbabwe	Quantitative-comparative study and cross-sectional study	5321 HIV/AIDS orphans (aged 12 to 17 years)	Self constructed measure of psychosocial distress using principle components analysis	HIV/AIDS orphans had more psychosocial distress than non-orphans. For both genders, paternal, maternal and double orphans exhibited more-severe distress than non-orphans and non-vulnerable children
Cluver et al. (2007). South Africa	Quantitative-comparative study and cross-sectional study	425 HIV/AIDS orphans, 241 non-HIV/AIDS orphans, 278 non-orphans (aged 10 to 19 years)	CDI, RCMA, SDQ, and Child PTSD checklist.	HIV/AIDS orphans were more likely to report symptoms of depression, suicidal ideation, peer relationship problems, post-traumatic stress, and delinquency and conduct problems than both non- HIV/AIDS orphans and non-orphans
He and Ji (2007). China	Quantitative-comparative study and school based cross-sectional design	93 HIV/AIDS orphans and 93 non-orphans (aged 8 to15 years)	BDI , SES, ISLQ, age-sex-specific criteria recommended by the WHO, UNICEF and UNU (2001)	The nutritional status of both HIV/AIDS orphans and non-orphans was extremely poor according to the prevalence of stunting, underweight, wasting and anemia. Depression, low self-esteem and lower quality of life were more frequent in HIV/AIDS orphans
Nyamukapa et al. (2006). Zimbabwe	Quantitative-comparative study and cross-sectional study	5321 children that included HIV/ AIDS orphans and vulnerable children (aged 12 to 17 years)	Newly constructed, Un- standardized measure used to assess psychosocial disorders	HIV/AIDS orphans reported higher psychosocial disorder and symptoms in high intensity than vulnerable children. Female gender living in an urban area and poor household had more psychosocial difficulties
Cluver and Gardner (2006). South Africa	Quantitative-comparative study and cross-sectional study	30 HIV/AIDS orphans and 30 non orphans (aged 6 to 19 years)	SDQ and IES-8.	HIV/ AIDS orphans were more likely to view themselves as having no good friends, to have marked concentration difficulties and to report frequent somatic symptoms but were less likely to display anger through loss of temper. HIV/ AIDS orphans were more likely to have PTSD
Gilborn et al. (2006). Zimbabwe	Quantitative-comparative study and exploratory cross-sectional survey	1258 HIV/AIDS orphans and vulnerable children (aged 14 to 20 years)	Newly constructed, un-standardized measure used to assess psychosocial distress	HIV/AIDS orphans reported higher stress and psychosocial distress and lower psychosocial wellbeing. Increase age and female gender were associated with higher Internalizing problems
Wild et al. (2006). South Africa	Quantitative-comparative study and cross-sectional study	81 HIV/AIDS orphans, 78 non-HIV/AIDS orphans and 43 non-orphans (aged 10 to 19-years)	RMAS, CDI, CBC and SEQ	Non- HIV/AIDS orphans reported more depression and anxiety than non-orphans, with HIV/AIDS orphan scores falling between the two groups and not differing significantly from either. Non-HIV/AIDS orphans showed lower self-esteem than both non-orphans and HIV/AIDS orphans
Atwine et al. (2005). Uganda	Quantitative-comparative study and cross-sectional study	123 HIV/AIDS orphans and 110 non-orphans (aged 11 to15 years)	BDI	HIV/AIDS orphans had greater risk for higher levels of anxiety than non-orphans. High levels of psychological distress was found in HIV/AIDS orphans
Chatterji et al. (2005). Rwanda	Quantitative- quasi-experimental pre-post-test design and cross-sectional study	HIV/AIDS orphans, children with chronically ill caregivers and non-orphans (n = 1160), (aged 6 - 12 years)	Newly constructed, Un- standardized worry/ stress scale	HIV/AIDS orphans and children living with sick caregivers reported higher distress than non-orphans
Bhargava (2005). Ethiopian	Quantitative-comparative study and cross-sectional study	479 HIV/AIDS orphans, 574 non-HIV/AIDS orphans (aged 10 to above years)	MMPI	HIV/AIDS orphans reported more social and emotional adjustment problems than other orphans

Table 1. Contd.

Rotheram-borus et al. (2001, 2004). USA	Quantitative-comparative study and longitudinal study	73 HIV/AIDS orphans and 138 children living with HIV-infected parents	Brief Symptom Inventory	HIV/AIDS orphans exhibited significantly higher internalizing and externalizing problems than children living with HIV-infected parents
Makame et al. (2002). Tanzania	Quantitative-comparative study and cross-sectional study	41 HIV/AIDS orphans and 41 non-orphans	Newly constructed, non-standardized internalizing problems scale	HIV/AIDS orphans showed higher internalizing difficulties than non-orphans. Age, gender, living apart from siblings and length of time with current caregiver was not associated with psychological distress
Manuel et al. (2002). Mozambique	Quantitative-comparative study and cross-sectional study	76 HIV/AIDS orphans and 74 non-orphans	Non-standardized internalizing problems scale	HIV/AIDS orphans reported higher depressive symptoms and were unlikely to have a trusted friend or adult. Caregivers' depression level correlated with children's depression and negatively with social support
Segendo and Nambi (1997). Uganda	Quantitative-comparative study and cross-sectional survey	169 HIV/AIDS orphans, 24 non-orphans (aged 6-20 years)	Newly constructed, non-standardized measure of depression	HIV/AIDS orphans showed higher levels of depression and lower optimism about life compared to non-orphans
Poulter et al. (1996). Zambia	Quantitative-comparative study and cross-sectional survey	22 households with orphans, 66 households with HIV+ caregiver or parent and 75 control families	Rutter scales	Conduct problems was low among all the children. HIV/AIDS orphans reported high levels of unhappiness and worry.

Full form of all scales: Children's Depression Inventory (CDI) (Kovacs, 1992), Children's Manifest Anxiety Scale-Revised (RCMAS) (Reynolds and Richmond, 1978), Child PTSD Checklist (Amaya-Jackson, 1995), Multiple Functions and Multiple Resources PSS Scale (PSS-MFMR) (Sherbourne and Stewart, 1991), Center for Epidemiological Studies Depression Scale for Children (CES-DC) (Fendrich et al., 1990), Children's Loneliness Scale (CLS) (Asher et al., 1984; Wang, 1993), Hospital Anxiety and Depression Scale (HADS) (Martin, 2005), Rosenberg's self-esteem (RSE) (Rosenberg, 1965), Multidimensional scale of perceived social support (MSPSS) (Zimet et al., 1988), Trauma Symptom Checklist for Children (TSCC) (Briere, 1996; Li et al., 2009), Trusting Relationship Questionnaire (TRQ) (Mustillo et al., 2005), PedsQL 4.0 Generic Core Scale (Mapi Research Institute, 2002), Modified version of the Children Future Expectation Scale (CFES) (Bryan et al., 2005), The Hopefulness about Future, and The Perceived Control over Future scales (HS, PCFS) (Whitaker et al., 2000), Life Incidence of Traumatic Events-Student Form (LITE-S) (Greenwald and Rubin, 1999), Regional Psychosocial Support Initiative (REPSI) (www.repsi.org), Beck Depression Inventory (BDI) (Beck et al., 1961), Life Quality for Children and Adolescents (ISLQ) (Zaohuo et al., 1998), The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997), Impact of Events Scale (IES) (Dyregrov and Yule, 1995), Child Behavior Checklist (CBC) (Achenbach, 1991), Self-esteem Questionnaire (SEQ) (DuBois et al., 1996), Minnesota Multiphasic Personality Inventory 2 (Hathaway and McKinley, 1989), The Rutter Scales (Rutter et al., 1970).

had increased internalizing problems compared with non-orphans ($p < 0.0001$) and 34% reported that they had contemplated suicide in the past year, compared to 12% of non-orphans ($p < 0.016$).

Manuel (2002) in rural Mozambique used a non-standardized internalizing problems questionnaire adapted from the instrument used by Makame et al. (2002). They interviewed 76 HIV/AIDS orphans, 74 non-orphans from the area and their caretakers. HIV/AIDS orphans had higher depression scores ($p < 0.001$), were more likely to be bullied ($p < 0.001$) and were less likely to have a trusted adult or friends ($p < 0.001$). Caregivers of HIV/AIDS orphans reported more depression ($p < 0.001$) and less social support than non-orphans.

In New York, an intervention-based study by

Rotheram-Borus et al. (2001) and Rotheram-Borus et al. (2004) used longitudinal assessments with standardized instruments. They compared 73 HIV/AIDS orphans with vulnerable children (138). After two years of parental death, the researchers found that HIV/AIDS orphans reported more emotional distress on the Brief Symptom Inventory (Derogatis and Melisaratos, 1983) and more behavioral problem for example, smoking, alcohol, crime and aggressive behavior than vulnerable children ($p < 0.05$). Other factors that increased child distress after two years of parental death were baseline severity of parental physical health symptoms and parental emotional distress. Atwine et al. (2005) in rural Uganda interviewed 123 HIV/AIDS orphans and 110 non-orphans, aged 11 to 15 years. Results using the Beck Youth Inventory (BYI, 1961) revealed that HIV/AIDS

orphans were more likely to be anxious (OR = 6.4), depressed (OR = 6.6), displayed anger (OR = 5.1) and showed significantly higher scores for feelings of hopelessness and suicidal ideation. Orphan status was revealed as the only significant predictor of outcomes on the basis of the asked questions related to current and past living conditions and a multivariate analysis of factors with possible relevance for BYI outcomes. In Rwanda and Zambia, Chatterji et al. (2005) compared HIV/AIDS orphans, children with chronically ill caregivers and non-orphans ($n = 1160$), aged 6 to 12 years. They were asked to complete a seven-item non-standardized worry/ stress scale developed from existing instruments. Results revealed that Zambian HIV/AIDS orphans scored higher than children with ill caregivers, who scored higher than non-orphans ($p < 0.04$). In

Rwanda, there were no differences between HIV/AIDS orphans and children with ill caregivers, but both groups scored higher than non-orphans ($p < 0.03$). Worry/stress was correlated with socioeconomic status ($p < 0.03$) and community cohesion ($p < 0.001$) in Rwanda.

In Ethiopia, Bhargava (2005) analyzed data from a survey of 479 HIV/AIDS orphans and 574 non-HIV/AIDS orphans. Orphans completed 60 items from the 657-item Minnesota Multiphasic Personality Inventory 2 (Hathaway and McKinley, 1989) with subscales of social adjustment ($\alpha = 0.80$) and emotional adjustment ($\alpha = 0.86$). HIV/AIDS orphan showed more emotional and social adjustment problems and HIV/AIDS orphan girls reported higher levels of difficulties than boys. Presence of the father, school attendance, household income, clothing conditions, distribution of food and emotional support within the fostering family came out as significant predictors of higher scores in both groups.

Cluver and Gardner (2006) interviewed 30 HIV/AIDS orphans and 30 non-orphans in Cape Town, South Africa. Standardized questionnaires - the strengths and difficulties questionnaire (Goodman, 1997) and the impacts of events scale (Dyregrov and Yule, 1995) were used. Both groups scored high for peer problems, emotional problems and total scores. However, HIV/AIDS orphans were more likely to view themselves as having no good friends ($p = 0.002$), have marked concentration difficulties ($p = 0.03$) and to report frequent somatic symptoms ($p = 0.05$), but were less likely to display anger through loss of temper ($p = 0.03$). HIV/AIDS orphans were more likely to report constant nightmares ($p = 0.01$) and 73% scored above the cut-off for posttraumatic stress disorder (PTSD).

Nyamukapa et al. (2006) in Zimbabwe utilized factor analysis to compare HIV/AIDS orphans and non-orphans ($n = 5,321$), aged 12 to 17 years. A 16-item non-standardized scale, with items from the child behavior checklist, Rand mental health inventory and Beck depression inventory were used to measure psychosocial disorders. Findings showed more psychosocial disorders amongst HIV/AIDS orphans ($p < 0.05$), which remained when controlling for poverty, gender, age of household head, school enrolment and adult support. Depression showed group differences, whereas anxiety did not. In Zimbabwe, Gilborn et al. (2006) interviewed 1258 HIV/AIDS orphans and vulnerable children, comparing groups by exposure to various psychosocial support programmes. A non-standardized instrument was developed from formative qualitative research and included six items suggestive of depression and two items suggestive of poor psychosocial well-being. HIV/AIDS orphans reported higher stress ($p < 0.05$) and more psychosocial distress ($p < 0.05$).

In the Eastern Cape of South Africa, Wild et al. (2006) completed a study with 10 to 19 years old adolescents. They compared 81 HIV/AIDS orphans, 78 non-HIV/AIDS orphans and 43 non-orphans. HIV/AIDS orphans were

recruited through NGOs. They used the revised children's manifest anxiety scale (Reynolds and Richmond, 1978), the 10-item child depression inventory (Kovacs, 1992), items from the child behavior checklist (Achenbach, 1991) and items from the self-esteem questionnaire (DuBois et al., 1996). The study also looked at potential moderating factors of adult, peer and neighborhood connection and regulation and psychological autonomy. Findings showed that non-HIV/AIDS orphans reported more depression ($p < 0.05$) and anxiety ($p < 0.05$) than non-orphans, with HIV/AIDS orphans scores falling between the two groups and not differing significantly from either. There were no group differences in terms of externalizing problems. Non-HIV/AIDS orphans showed lower self-esteem than both non-orphans and HIV/AIDS orphans. Of the potential protective factors for all orphans, greater autonomy from caregiver and greater neighborhood regulation were significantly associated with lower anxiety ($p < 0.001$). Greater connection with caregiver and greater peer regulation were associated with lower depression ($p < 0.001$).

In China, He and Ji (2007) assessed the influence of HIV/AIDS orphanhood on children's nutritional status, psychological well-being and life quality. 186 children aged 8 to 15 years (93 HIV/AIDS orphans and 93 non-orphans) from a rural area of Henan Province were surveyed in a cross-sectional and matched pairs study on nutritional status, psychological health and life quality. They found no compelling evidence for poorer nutritional status in orphans. The nutritional status of both HIV/AIDS orphans and non-orphans was extremely poor according to the prevalence of stunting, underweight, wasting and anemia. Depression, low self-esteem and lower quality of life were common in orphans. These differences mainly existed in boys' groups. No significant differences were found between paternal, maternal and double orphans or orphans in orphanages or extended families. Regression analysis revealed that orphanhood leads to low self-esteem and high depression which contributes to lower quality of life and mediates the association between orphanhood and quality of life.

In Cape Town, South Africa, Cluver et al. (2007) interviewed 1061 children. 455 were HIV/AIDS orphans, 278 were non-orphans and 243 were orphans as a result of deaths from other causes and 85 orphans as a result of deaths from unknown causes. Standardized psychological questionnaires used were: child depression inventory (Kovacs, 1992), the revised children's manifest anxiety scale (Reynolds and Richmond, 1978), the child behaviour checklist (Achenbach, 1991) and the children's PTSD checklist (Amaya-Jackson et al., 2000) with many scales matched to those used in the South African Eastern Cape study (Wild et al., 2006) to allow for cross-provincial comparison. HIV/AIDS orphans reported higher levels of depression, peer problems, post-traumatic stress, conduct problems and delinquency ($p < 0.001$) than both non-orphans and orphans as a result of deaths

from other causes. Differences remained when controlling for socio-demographic factors such as age, gender, poverty, migration and household composition. No differences were found in terms of anxiety.

In Zimbabwe, Chitiyo et al. (2008) sought to ascertain the effectiveness of psychosocial support (PSS) among AIDS orphans in improving their schooling outcomes. A total of 20 HIV/AIDS orphans with ages ranging from 10 to 14 years, attending four different primary schools located in the rural wards of Mberengwa district were involved in this study. All the HIV/AIDS orphans showed signs of emotional need and they were lagging behind in their academic work. Psychosocial support was provided to these children over a period of eight months resulting in improvements in several areas, including schoolwork during and after the intervention period. In Zimbabwe Nyamukapa et al. (2008) measured the psychosocial effect of orphanhood on a sub-Saharan African population. He used data from 5321 children aged 12 to 17 years who were interviewed in a 2004 national survey in Zimbabwe. A measure was constructed using principle components analysis to measure psychosocial distress. A regression analysis was used to obtain standardized parameter estimates of psychosocial distress and odds ratios of early sexual activity. Results found that HIV/AIDS orphans had more psychosocial distress than non-orphans. For both genders, paternal, maternal and double orphans exhibited more-severe distress than did non-orphans and non-vulnerable children. Orphanhood remained associated with psychosocial distress after controlling for differences in more-proximate determinants. Maternal and paternal orphans were significantly more likely than non-orphans, non-vulnerable children to have engaged in sexual activity. These differences were reduced after controlling for psychosocial distress.

In South Africa, Cluver et al. (2008) examined associations between AIDS-orphanhood status, poverty indicators and psychological problems (depression, anxiety, post-traumatic stress, peer problems, delinquency, and conduct problems) among children and adolescents in townships surrounding Cape Town, South Africa. One thousand and twenty-five children and adolescents completed standardized and culturally sensitive cross-sectional surveys. HIV/AIDS orphans had more psychological problems including depression, peer problems, post-traumatic stress, and conduct problems. Specific poverty indicators including food security, access to social welfare grants, employment in the household and access to school were associated with better psychological health. Poverty indicators mediated associations of HIV/AIDS-orphanhood with psychological problems. Food security showed the most consistent association with reduced psychological problems. It was concluded that poverty alleviation measures have the potential to improve psychological health for HIV/AIDS-orphans in South African townships.

Kuzinger et al. (2008) compared HIV/AIDS orphans

and non orphans regarding educational status and delay in school using data collected in 3 low income communities affected by AIDS in Tanzania and Burkina Faso. HIV/AIDS orphans were significantly more likely not to attend school than were non-orphans and also to be delayed when in school, though after controlling for confounders the risk was borderline and non-significant. Multivariate analysis indicated that variables such as age, religion, and origin of family, the relation between the child, the head of household and the dependency ratio of the household better explained the differences in education than orphan status.

In China, Zhang et al. (2009) designed to explore the effect of future orientation in mediating the relationship between traumatic events and mental health of HIV/AIDS orphans in rural China. Cross sectional data were collected from 1221 children affected by HIV/AIDS (755 AIDS orphans and 466 vulnerable children). Future orientation among children was measured using three indicators (future expectation, hopefulness toward the future, and perceived control over the future). Measures of mental health consisted of depression, loneliness and self-esteem. Children's experience of any traumatic events was measured using a modified version of the Life Incidence of Traumatic Events-Student Form. Mediation analysis was conducted using structural equation modeling (SEM) methods. Results found that most of the traumatic indicators were negatively associated with future expectation, hopefulness, perceived control, self esteem and positively associated with depression and loneliness. The SEM of mediation analysis demonstrated an adequate fit. Future orientation fully mediated the relationship between traumatic events and mental health and accounted for 67.9% of the total effect of traumatic events on mental health.

In China, Lin et al. (2010) conducted a study on 755 HIV/AIDS orphans (children who had lost one or both parents to HIV/AIDS), 466 vulnerable children (who lived with HIV-infected parents) and 404 non-orphans (who did not experience HIV-related illness and death in their families) with three objectives: (1) Examine the psychometric properties of two parallel measures of HIV-related stigma (that is, perceived public stigma and children's personal stigma against PLWHA) among HIV/AIDS orphans, vulnerable children and comparison children; (2) examine whether expressions of stigma measures differ by child's sex, developmental stage, family socio-economic status or orphanhood status (that is, HIV/AIDS orphans, vulnerable children, and comparison children) and (3) examined the association between HIV-related stigma and children's psychosocial adjustments among status HIV/AIDS orphans, vulnerable children, and comparison children. The measures included perceived public stigma, personal stigma, depressive symptoms, loneliness, self-esteem, future expectations, hopefulness about the future, and perceived control over the future. Results found that both stigma scales were positively

associated with psychopathological symptoms (for example, depression, loneliness) and negatively associated with psychosocial wellbeing (for example, self-stigma, positive future expectation, hopefulness about future, and perceived control over the future). Both stigma measures contribute to children's psychosocial problems independent of their orphanhood status and other key demographic factors.

In China, Xu et al. (2010) did a study to explore the main influencing factors of the health related quality of life (HRQL) of children living in HIV/AIDS-affected families. The HRQL of 116 children aged 8 to 17 years from HIV/AIDS-affected families and of 109 children from unaffected families was evaluated by the Chinese Version of PedsQL TM 4.0. Some potential influencing factors were investigated like demographic characteristics, the families' social and economic status, foster models, children's self-esteem etc. The HRQL of the children's caregivers may also have been among the influencing factors, as measured by the SF-36. Multiple regression analysis was used to explore the influence of independent variables on children's HRQL. Results showed that lower scores of children's self-esteem and caregivers' SF 36 reduced the majority of the PedsQL domains and children from HIV/AIDS-affected families reported lower scores of HRQL than those from unaffected families, especially in the psychosocial functioning, emotional functioning and school functioning domains. Children living with grandparents reported higher PedsQL scores in psychosocial health, social functioning and school functioning. Disclosure of parental HIV/AIDS status reduced children's PedsQL scores in emotional functioning and social functioning. Caregivers spending more hours accompanying the children appeared to increase the PedsQL scores in psychosocial health and school functioning.

In China, Zhao et al. (2010) compared psychological symptoms among double HIV/AIDS orphans (that is, children who lost both of their parents to HIV/AIDS) who were in the care of different family-based caregivers (that is, surviving parent, grandparents, other relatives, and non-relatives) before they were replaced in orphanages. The participants included 176 double HIV/AIDS orphans from four HIV/AIDS orphanages in rural China. Prior to being replaced in AIDS orphanages, these children had received family-based care by different caregivers, which included surviving parent (38%), grandparents (22%), other relatives (19%) and non-relatives (22%). Both bivariate and multivariate analyses suggested that children who were previously cared for by non-relatives scored significantly higher in traumatic symptoms, depression and loneliness scales than children who were previously cared for by their surviving parent, grandparents and other relatives. Children in the care of grandparents reported the best scores on all psychological measures among children in the care of non-parent relatives. Multivariate analysis, controlling for

children's gender, age, length in orphanages, number of household replacements and total duration of replacement revealed that the type of caregivers were significantly associated with psychological problems.

In China, Hong et al. (2010) examined the relationship between perceived social support (PSS) and psychosocial wellbeing among HIV/AIDS orphans. A cross-sectional survey was administered to 1,625 children (aged 6 to 18 years) in Henan Province, an area with a large number of HIV cases due to unhygienic commercial blood/plasma collection. The sample included 296 double orphans (children who lost both parents to HIV/AIDS), 459 single orphans (children who lost one parent to HIV/AIDS), 466 vulnerable children (children living with HIV-infected parents) and 404 non-orphans (children who did not experience HIV-related illness and death in family). Data suggests that vulnerable children reported the lowest level of PSS compared to HIV/AIDS orphans and non-orphans. Level of PSS was significantly and positively associated with psychosocial wellbeing even after controlling for potential confounders. The study underscores the importance of providing social support and mental health services for AIDS orphans in China.

In China, Zhao et al. (2010) compared psychosocial well-being between paternal and maternal orphans on a sample (N = 459) of children who had lost one parent to HIV and who were in family-based care. Measures included academic marks, education expectation, trusting relationships with current caregivers, self-reported health status, depression, loneliness, posttraumatic stress and social support. No significant differences were found between maternal and paternal orphans, except that paternal orphans reported better trusting relationships with caregivers than maternal orphans. Children with a sick parent reported significantly higher depression, loneliness, posttraumatic stress and social support scores than children with a healthy surviving parent. Findings underscore the importance of psychosocial support for children whose surviving parent is living with HIV or another illness.

In China, Zhao et al. (2011) assessed the relationship between perceived social support (PSS) and psychosocial wellbeing on 1,299 rural HIV/AIDS orphans in central China. They examined the relative importance of PSS functional measures (informational/emotional, material/tangible, affectionate and social interaction) and PSS structural measures (family/relatives, teachers, friends, and significant others) in predicting psychosocial outcomes including internalizing problems, externalizing problems and educational resilience. Both functional and structural measures of PSS provided reliable measures of related but unique aspects of PSS. The findings of the study confirmed the previous results that PSS is highly correlated with children's psychosocial wellbeing and such correlations vary by functions and sources of the PSS as well as different psychosocial outcomes. The findings in the study suggested the roles of specific social

support functions or resources needed to be assessed in relation to specific psychosocial outcome and the context of children's lives. The strong association between PSS and psychosocial outcomes underscores the importance of adequate social support to alleviate stressful life events and improve psychosocial wellbeing of HIV/AIDS orphans.

In China, Hong et al. (2011) examined the relationship between HIV/AIDS orphans' care arrangement and their psychosocial well-being among a sample of HIV/AIDS orphans in rural China. A total of 296 children who lost both parents to HIV/AIDS participated in the study, including 176 in orphanages, 90 in kinship care and 30 in community-based group homes. All participants completed a cross-sectional survey assessing their traumatic symptoms, physical health and schooling. Data revealed that the HIV/AIDS orphans in group homes reported the best outcomes in three domains of psychosocial well-being, followed by those in the orphanages and then the kinship care. The differences in psychosocial well-being among the three groups of children persist after controlling for key demographic characteristics. The finding suggests that the appropriate care arrangement for HIV/AIDS orphans should be evaluated within the specific social and cultural context where the orphans live. In resource-poor regions or areas stricken hardest by the HIV/AIDS epidemic, kinship care may not sufficiently serve the needs of HIV/AIDS orphans.

In South Africa, Cluver et al. (2012) investigated a 4-year longitudinal follow-up of HIV/AIDS-orphans with non-HIV/AIDS orphans and non-orphans. 1021 children (M = 13.4 years, 50% female, 98% isiXhosa-speaking) were interviewed in 2005 and followed up in 2009 with 71% retention (49% female, M = 16.9 years), in poor urban South African settlements. Children were interviewed using socio-demographic questionnaires and well-validated standardized scales for assessing depression, anxiety, and post-traumatic stress. Data was analyzed using mixed-design analysis of variance (ANOVA) and backward-stepping regression. Results revealed that AIDS-orphans showed higher depression, anxiety and post-traumatic stress disorder scores in both 2005 and 2009 when compared with non-HIV/AIDS orphans and non-orphans. Backward-stepping regression, controlling for baseline mental health and socio-demographic cofactors such as age, gender and type of bereavement revealed that being HIV/AIDS orphans in 2005 was associated with depression, anxiety and PTSD scores in 2009. This was not the case for non-HIV/AIDS orphans or non-orphans. Age interacted with orphan status, such that there was a steep rise in psychological distress in the HIV/AIDS-orphans group, but no rise with age amongst non-HIV/AIDS orphans and non-orphans.

In South Africa, Cluver et al. (2012) conducted a study on 1025 youth, they were interviewed in 2005 and followed up in 2009 (71% retention). Participants completed standardized measures of anxiety, depression, and posttraumatic stress. Comparison groups were youth

who were HIV/AIDS-orphans, non-HIV/AIDS orphans and non-orphans and those whose caregivers were sick with HIV/AIDS, sick with another disease or healthy. Results of longitudinal analyses showed that both HIV/AIDS-orphanhood and caregiver HIV/AIDS sickness predicted increased depression, anxiety and posttraumatic stress symptoms over a 4-year period, independently of socio-demographic cofactors and of each other. Caregiver sickness or death by non-HIV/AIDS causes and having a healthy or living caregiver did not predict youth symptomatology. Youths simultaneously affected by caregiver HIV/AIDS sickness and HIV/AIDS-orphanhood showed cumulative negative effects.

Qualitative study

Xu et al. (2009) investigated the psychosocial well-being of children in HIV/AIDS-affected families in rural China from the child's and caregiver's perspectives. Semi structured interviews were conducted among children living in HIV/AIDS-affected families (n = 16), their caregivers (n = 16) and key community informants (n = 5). Findings showed that all of the children relied heavily on caregivers and peers to gain psychological support. Children's psychosocial problems included fear, anxiety, grief, loss of self-esteem and confidence. Stigma towards children existed including isolation, ignorance and rejection. The study illustrates that HIV/AIDS has impacted negatively on the psychosocial wellbeing of orphans.

Quantitative and Qualitative data studies

In Zimbabwe, Nyamukapa et al. (2010) used quantitative and qualitative method to measure the effects of orphanhood on psychological distress. Depression and anxiety scales were adapted from WHO self-report questionnaire and 14 group discussions with children were done to assess psychological distress. AIDS orphans were found to suffer greater psychological distress than non-orphans (sex- and age-adjusted coefficient: 0.15; 95% CI: 0.03 to 0.26; P = 0.013). Trauma, being out-of-school, being cared for by a non-parent, inadequate care, child labor, physical abuse, stigma and discrimination were the contributing factors for increased level of distress in AIDS orphans. Increased mobility and separation from siblings did not contribute to greater psychological distress in this study. Over 40% of HIV/AIDS orphans in the sample lived in households receiving external assistance. However, receipt of assistance was not associated with reduced psychological distress. In Ethiopia, in Addis Ababa, Getachew et al. (2011) compared the psychological distress of HIV/AIDS orphans to non-HIV/AIDS orphans and factors related to it. Comparative cross-sectional design combining both quantitative and qualitative methods was used. An equal number of 438 subjects were included in

this study with each group of HIV/AIDS and non-HIV/AIDS orphans between 11 to 18 age groups.

Structured interviewer administered questionnaire and scales including Hospital Anxiety and Depression Scale (HADS), Rosenberg's self-esteem scale and multidimensional perceived social support scale (MPSS) scale were used. Results found that among the study participants, 279 (34.7%) orphans where 157 (39.1%) of HIV/AIDS and 122 (30.3%) of non-AIDS orphans were depressed in the week before the survey. Moreover, 301 (37.4%) orphans where 164 (40.8%) of HIV/AIDS and 137 (34.1%) of non-HIV/AIDS once were anxious. However, the difference observed in depression and anxiety [OR (95% CI) = 1.164 (0.733, 1.754) and 0.88 (0.57, 1.33)] was not statistically significant. The main predictor variables of depression and anxiety in both study groups were their perceived social support and self-esteem. Factors such as discrimination, school enrollment, physical abuse, child labor were also identified as predictors.

Literature review also provides some conflicting and contradictory data related to anxiety of HIV/AIDS orphans. High anxiety level of HIV/AIDS orphans have been found in some studies and factors like recent death in the family (Nyamukapa et al., 2010), seriously ill or sick (AIDS-affected) caregivers (Cluver et al., 2012), inadequate care, child labour, physical abuse, school dropout, food insecurity, unemployment (Nyamukapa et al., 2010), stigma and discrimination, changes in the interpersonal relationship (Xu et al., 2009) and the events of bad happenings in life (Gilborn et al., 2006) seem to be attributing it. On the other hand, anxiety was found to be low in some studies. The possible explanation could be the same state of all children – death of parents, same living situations, receipt of good welfare grants, government initiatives, good caregivers, and healthy psycho-social environment of the rehabilitation centre.

The nature and effects of psychosocial support also appeared to vary across studies. High PSS level of HIV/AIDS orphans was found in China and it is due to the initiative of Chinese government (Hong et al., 2010). They have paid more attention to HIV/AIDS double orphans in terms of welfare and social support. Whereas others had low PSS level because they experience more HIV-related stigma and stigmatization due to ongoing parental HIV infections, inadequate care, child labour, physical abuse, school dropout, food insecurity, unemployment (Nyamukapa et al., 2010), changes in the interpersonal relationship (Xu et al., 2009) and less care and support from the rehabilitation centres and caregivers.

Mental health of HIV/AIDS orphans

Death of parents introduces a major change in the life of a child. This change may involve moving from a middle or

upper-class urban home to a poor rural relative's home, separation from siblings, forced to live on own and constituting child-headed families. All these changes easily affect not only the physical but also the psychological well-being of a child. Review of the literature suggests that possible factors such as socioeconomic status, abuse, social support, family disruption and stigma pose psychological difficulties on HIV/AIDS orphans. Parental illness and death also increase their economic burden causing HIV/AIDS orphans to suffer from inadequate food insecurity, stigma, bullying, shelter, material goods, access to health services and withdrawal from school (Cluver and Orkin, 2009). On the basis of literature review, the following mental health status of HIV/AIDS orphans comes into light. They severely experience negative emotions like anxiety (Atwine, 2005; Pelton and Forehand, 2005; Xu et al., 2009), high emotional and psychological distress (Nyamukapa et al., 2010), hopelessness, loneliness, frustration (Mbozi et al., 2006; Lin et al., 2010), depression (Tyrer, 2010; Kaggwa and Hindin, 2010; Getachew et al., 2011), suicidality (Makame et al., 2002) and post-traumatic stress symptoms (Cluver and Gardner, 2006; Cluver et al., 2007).

Behavioral problems like peer problems (Draimin et al., 1992), conduct problems (Rotheram-Borus, 2004; Lee et al., 2007), delinquency (Cluver et al., 2007), antisocial behavior (Wild et al., 2006). They also experience low self-esteem (Xu et al., 2010; Lin et al., 2010; He and Ji, 2007), lower future expectation and optimism (Zhao et al., 2010; Segendo and Nambi, 1997) and higher levels of psychological difficulties like emotional detachment, behavioral regression, withdrawal, guilt, fear (Stein, 2003; Foster and Germann, 2002; Cluver et al., 2008), poor school functioning and academic performances (Xu et al., 2010). HIV/AIDS orphans living with grandparents, in community and orphanages, had better mental health and psychological well-being than children living with non-relatives and kinship care (Hong et al., 2011; Zhao et al., 2010).

RECOMMENDATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

HIV/AIDS is an emerging area of research and researches are being conducted in understanding the state of HIV/AIDS orphans. Still, there are needs for more aggressive and systematic quantitative research aimed to assess: (1) what are the psychological risks to HIV/AIDS orphans (mental health, psychological well-being, quality of life etc.); (2) the causes underlying them and mediating processes responsible for them; (3) the factors that might enhance mental health, psychological well-being, overall development and quality of life; (4) evidence based intervention programmes that can be imparted for their well-being. For this, well designed studies are required

which would compare HIV/AIDS orphans in multiple domains with non-HIV/AIDS orphans and non-orphans drawn from the same communities and who live in different institutional cares. Such research is important for determining which components of the non-HIV/AIDS orphan's and non-orphan's responses are common to HIV/AIDS orphans and what is unique about HIV/AIDS orphans that require special attention and resources to meet their needs.

Long-term, prospective longitudinal studies are also required to assess HIV/AIDS orphan's mental health, physical health status, medication, psychosocial needs and coping strategies at various periods of life, to investigate how short-term problems, difficulties and distress relates to long-term outcomes and to evaluate the effectiveness of intervention programs. Such quantitative research should be supported by qualitative studies describing children's experience of living with HIV/AIDS in the orphanage, how they obtain emotional support and how these variables are associated with their good mental health.

Researchers investigating the mental health of HIV/AIDS orphans may confront several methodological challenges for example, lack of consensus about how to define the population, availability of sample, small sample sizes, recruitment of research team, interest of researchers, availability of required measures, construction of new measures, data collection and data analysis etc. It is also tough for the researchers to elicit valid data from children relating to sensitive topics like emotional and behavioral responses, attitudes toward their current caretaker, and data relating to physical or sexual abuse. It is important to be aware of these methodological issues and how they might influence the results obtained. Nevertheless, it is not that these difficulties cannot be overcome and they should not stop researchers from attempting to learn more about the experiences and needs of HIV/AIDS orphans. As the numbers of HIV/AIDS orphans is rapidly growing into a pandemic, providing them with care and protection is an increasing national and global concern. We need to know how to identify HIV/AIDS orphans, how their mental health is at risk and develop evidence based prevention and intervention programmes. Methodologically rigorous research is required in this field, so that grass root realities are made available to the programmes and policies makers that are attempting to work for their wellbeing and betterment.

The authors being Indian wants to share that HIV/AIDS is an emerging topic of research in India. The research is basically focused regarding the medical and psychological aspects of HIV/AIDS. AIDS orphans are a highly ignored issue in India still. The researchers have explored it as a disadvantaged group and researches have started in this field. Several Indian researches can be found on HIV/AIDS related to adherence, risk-behaviors, mobile populations etc. and research has started in this field also.

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Full Length Research Paper

Personal responsibility for human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) infection

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Personal responsibility for human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) infection led to the aim of this study by investigating the belief that those who live with HIV/AIDS have only themselves to blame for their calamity. Participants were drawn from high school and university students in America, Kenya, South Africa and Tanzania. The method used in the analysis of data was quantitative and qualitative in the form of descriptive statistics, comprising frequency, percentage, Chi-square and probability. The results showed that majority of participants rejected the statement that HIV/AIDS persons have only themselves to blame. This was in contrast with what most researchers have reported in the recent past. It was concluded that taking the position that HIV/AIDS infected persons are not to blame is dangerous, irresponsible and flawed, given its implications.

Key words: Human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), infection, blame, accountability, defence mechanism, personal responsibility.

INTRODUCTION

For the past three decades, there has been controversy as to who should be held accountable for the transmission of human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) (Mwamwenda, 2013; Barton, 2012; Plot, 2012; Zugar, 2010). Personal responsibility for the infection of HIV/AIDS seeks to investigate the answer to this issue on the basis of literature review and empirical analysis of participants' responses.

Rodlach (2006) relates HIV/AIDS to a witch's curse, an imperialist conspiracy and a racist theory. Furthermore, it is pointed out that from a small village to an international system, explanation is provided where it originates, who is infected and those who die as a result; all of which may be associated with political agenda, religious beliefs and the psychology of devastating grief. It is his view that, such explanations are in conflict with some and clash

with prevention and treatment programmes. He sums this as constituting the culture of blaming others for the occurrence of HIV/AIDS. Pape (2005) elaborates on this, as he argues that by blaming someone for engaging in what is considered unacceptable, society disassociates with such behavior, and therefore is not held accountable for their behaviors and whatsoever may be expected in the form of healthcare.

HIV/AIDS is frequently associated with fear, denial, discrimination and stigma. Stigma is associated with HIV/AIDS as a result of people's limited knowledge, given that they perceive it as life-threatening; people are scared of being infected by such disease (Viser, 2007; Plot, 2012; Speaks-Lewis, 2011). In most cases, those living with HIV/AIDS are blamed for contracting it. It is regarded as engaging in promiscuity for which the HIV/AIDS infected are divinely punished (Phiri, 2004; Barton, 2012).

As a matter of fact, it can be argued that, people have a propensity to blame those who are HIV/AIDS infected. According to Zugar (2010) each person has a portion of mind, which is inclined to react to illness of any kind with anger, disbelief as well as a quest for blame. "We cannot experience illness without casting around for blame" (Zugar, 2010). She further argues that "majority of people have grown up with the knowledge that sensible people play safe and therefore in the event sexually transmitted disease catches up with your life, you have no one else to blame except yourself" (Ibid)

Along a similar train of thought, McClean (2005) argues that, there is inclination for people who are ill to either blame themselves or others for their ill-health. To illustrate such an assertion, he cites both the UK and US where people hold the view that people are responsible for their health well-being. The implication being self-control and self-mastery. As a result, people who are ill will do their best to have their normal health restored.

Watson et al. (2012) in a sample of 971 university students asked, as regards HIV/AIDS infected people, whether they would avoid meeting in proximity, pronounce judgement and blame them and avoiding personal intimacy. The results indicated that judgement, blame and intimate avoidance were high in the event HIV/AIDS was contracted as a result of engaging in unprotected sex. In a study of 1,450 tertiary education students, Akande et al. (2011) reported that in Africa, HIV/AIDS is perceived as a disease of such shame that, it is concluded that those who are HIV/AIDS positive are held responsible for their calamity.

Similarly, Ekstrand et al. (2012) made a study of 1,076 on-HIV/AIDS Indian patients in India regarding blame, symbolic stigma and HIV misconceptions. The results showed that, 82% respondents were of the view that a person infected with HIV/AIDS was served right to have had the infection. As a result of stigma and blame, those living with HIV/AIDS undergo more suffering than warranted. In fact, it becomes a deterrent to the quest for counselling and testing and their desire to divulge their infection to others and seeking medical help (Sayles et al., 2007; Viser, 2007). Such behavior may continue to prevail to the extent that the disease may develop resistance to intervention and what would otherwise have been beneficial and therapeutic.

In the study of reversing the culture of blame among seafarers in the Philippines, Plot (2012) asserts that HIV/AIDS attracts prejudice together with stigmatization and exclusion of those who happen to be living with the most dreaded disease in human history. Seafarers as other employees do go through such pathetic experience. In general, prejudice of employers in the form of denial of work availability and employment benefits are difficult to secure for those living with HIV/AIDS. Plot (2012) advances the argument that HIV/AIDS is referred to as self, a work related disease, and for that reason, it cannot be compensated. Seafarers living with HIV/AIDS are also

not eligible for compensation. In fact, seafarers living with HIV/AIDS are declared and identified as "guilty of notorious negligence for having inflicted the illness upon themselves" (Plot, 2012).

Sayles et al. (2007) in a study of 48 HIV/AIDS respondents of low income in Los Angeles, America, participants expressed that they were blamed for being HIV/AIDS and that they also judged themselves for having contracted the disease. Those living with HIV/AIDS were condemned for their behavior which led to their current state of affair, "considered to be deserving of HIV because of their behavior or high risk behaviours" (Sayles et al., 2007).

In Jordan, blame is expressed in various ways (Enns, 2011). To begin with, it is forbidden to say the word "AIDS". Should one have contracted it, the end results are: one loses his/her job; disowned by one's family; and rejected by friends. As such, there is strong resistance to being tested for HIV/AIDS. Should one find out that he or she has contracted it, he/she is very unlikely to divulge it to anyone, including the closest relatives. In fact, contracting HIV/AIDS is interpreted to mean, "it- serves-you-right".

There are three types of blame, namely internal, external and societal (Speaks-Lewis, 2011). Internal blame is based on the cause of the event linked to the person as an individual, such as physical traits, moral and lack of ability. These are interpreted as instrumental in the behavior of a person subjected to blame and stigma. External blame emerges when perception of intent is assigned to situational variables. Whereas the behaviour or circumstance is given due recognition, the actor is not blamed. Societal blame entails an association between the causes of event/circumstance with societal factors, such as a lack of resources or simply discrimination.

Consequently, the observer does attribute blame to the person, if the event/circumstance is externally and societal based. In the case of an HIV/AIDS person, he/she is perceived to have flawed personality, which accounts for contracting HIV/AIDS. In this context, there is school of thought which attributes contracting HIV/AIDS to being involved in morally bad behaviour (Enns, 2011; Sayles et al., 2007; Watson et al., 2012).

In summary, there is ample evidence that HIV/AIDS infected persons are held accountable for having contracted the disease. In their being held accountable for such behavior, it is insinuated that this is a recompense for their divinely unacceptable sexual activity. Both conclusions are controversial in nature without accompanying clarity. Hence, the rationale for the present investigation regarding personal responsibility for HIV/AIDS transmission.

METHODOLOGY

The sample of the present investigation comprised adolescents drawn from high school students based in Nairobi, Kenya and

Table 1. Frequency percentage Chi-square and probability (N=581).

S/N	Country	Frequency	%	χ^2	P
1	America (N=58)	2	0.03	97.7	0.001
2	Kenya (N=102)	44	43	46.9	0.001
3	Kenya (High School, N=157)	60	38	151.2	0.001
4	South Africa (N=164)	63	38	43.5	0.001
5	Tanzania (N=100)	20	20	68	0,001

People who live with HIV/AIDS have only themselves to blame.

university students consisting of American, Kenyan, South African and Tanzanian participants both males and females. The total number of participants added up to 581 with a distribution of 157 Kenyan high school students, 102 Kenyan university students, 164 South African university students, 100 Tanzanian university students and 58 American college students.

Measuring instrument

The questionnaire comprised one question soliciting a response on the basis of three options, namely "Yes, No, Don't Know". All that was expected was to tick the option that was descriptive of what they knew about HIV/AIDS. The question read as follows: "People who live with HIV/AIDS have only themselves to blame".

Procedure

Since the researcher could not be in all places at the same time, arrangement was made for university lecturers to be responsible for administering the questionnaire to their respective students. This was done after meeting what was expected of them by their respective institutions in administering such a questionnaire. The responding to the questionnaire was preceded by the lecturer concerned explaining to the participants what was expected of them. They were also advised that they had the choice of responding to the questionnaire, if they so wished. In addition to the statement, participants were to fill in their gender and date of birth. For the purpose of confidentiality, participants were not permitted to write their names or institution of affiliation. On completion of the questionnaire, the lecturers collected the papers which were sent to the researcher in New York for scoring and analysis.

RESULTS

Descriptive statistics in the form of frequency, percentage, chi-square and probability were used as a method of data analysis as displayed in Table 1.

The response to the statement that those living with HIV/AIDS have only themselves to blame for their state of health, the response in percentage for America was 0.03%, Kenya high school 38%, Kenya university 43%, South Africa 38% and Tanzania 20% who supported the statement that those who live with HIV/AIDS have only themselves to blame. Each one of the five diverse groups rejected the statement. In terms of chi-square, the results were as follows: χ^2 (2df, N155)=151.2, $p<0.001$ Kenya high school; χ^2 (2df, N100)=46.9, $p<0.0001$ Kenya

university; χ^2 (2df, N162)=84.5, $p<0.001$ South Africa; χ^2 (2df, N98)=79.7, $p<0.001$ Tanzania; χ^2 (2df, N56)=97.7, $p<0.001$ America. All the values of the chi-square were statistically significant in favour of those who rejected the statement that HIV/AIDS infected persons have only themselves to blame.

In summary, the analysis of data showed that adolescents at high school level as well as at university are in unison that those who are HIV/AIDS are not responsible for their state of health and misfortune. If this is so there is silence as who is supposed to be accountable for it other than the implied fate.

DISCUSSION

In view of the various controversies that have risen regarding the perceptions and interpretations of HIV/AIDS, personal responsibility for HIV/AIDS transmission sought to verify the position taken in many societies that, people who have contracted HIV/AIDS have themselves to blame. Such stance has serious implications for those suffering from such disease and society, which has the responsibility for caring for such people. In response to the questionnaire administered to 581 respondents drawn from America, Kenya, South Africa and Tanzania, the results were overwhelmingly opposed to the statement that people living with HIV/AIDS have on themselves to blame. Such findings were in contrast to the vast majority of research findings which have repeatedly confirmed that, indeed HIV/AIDS persons are to blame for the disease they have inflicted on themselves.

It is assumed that, when it is argued that HIV/AIDS people are accountable, this is so concluded on the understanding that they were knowledgeable enough to know that they were taking a risk engaging in activities, that would predispose them to contracting HIV/AIDS. If this is the basis for the statement, then it makes sense. The problem with HIV/AIDS is that in both secular and religious circles, the disease is associated with morality, and therefore it is interpreted as a divine punishment for engaging in what is interpreted as law of morality. Such interpretation is unwarranted.

In terms of other findings, as reported in the review of

literature, the researchers are unanimous in emphasizing that indeed an individual is accountable for his well-being and if she/he fails to do this successfully, then she/he has no one else to blame except him/herself.

According to Zuper (2010), human beings find themselves restless, until they have an external explanation for why they are ill, so that someone else is blamed for it. Very seldom do they internalize the source of the existing problem. Similar position has been expressed in Speaks-Lewis (2011). Plot (2012) cites the experience of seafarers who were categorically held accountable for having negligently contracted HIV/AIDS, since they knew better than contracting the disease. Other researchers have also forcefully expressed similar findings based on their studies, without implying that they themselves subscribe to such position (MacClean, 2005; Enns, 2011; Pape, 2005; Akande et al., 2011; Viser, 2007).

Despite all the evidence in support of the view that HIV/AIDS infected persons be beheld accountable for it, the findings of the present investigation support the view that HIV/AIDS persons are not to be blamed for their state of health, implying that whatever happened to them was beyond their control. Such argument is flawed in so far as everyone is expected to exercise self-control and self-mastery in life. Denying that one is responsible for the contracted HIV/AIDS is but a defence mechanism that is inherently flawed.

Conclusion

Based on the findings of this investigation, majority of the respondents rejected the belief that people living with HIV/AIDS have only themselves to blame. As empirical as this conclusion maybe, it cannot be left unchallenged, given its implication in human behavior. Taking such position means people should not be concerned about contracting HIV/AIDS, since they are not are responsible for it. Such a position would be dangerous and irresponsible. As rational beings we can do better than that. HIV/AIDS is real, and it cannot be combated by burying their heads in the sand.

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Full Length Research Paper

HIV/AIDS knowledge of high school adolescents in Kenya

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The primary purpose of this investigation was to assess the level of human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) knowledge of high school adolescents in Kenya. As a subsidiary, objective of the investigation was to determine whether there was transfer of knowledge between boys and girls regarding their sexual behaviour. The results showed that adolescent high school students have a high level of knowledge of HIV/AIDS and that such knowledge transfers to the sexual relationship between boys and girls. The sample of the study consisted of 157 participants attending two high schools in Nairobi. Participants were administered a questionnaire based on HIV/AIDS transmission, infection and prevention. The method of data analysis used were frequencies, percentage and the chi-squared test. The study concluded that, even though the level of HIV/AIDS knowledge was high, there were identified misconceptions which would further justify the continued promotion of public education regarding HIV/AIDS. Unlike similar studies, this study found a correlation between knowledge and the transfer of this knowledge to change of behaviour. This study shows that public education does produce dividends in the prevention of HIV/AIDS transmission and the spread of the epidemic worldwide.

Key words: Avoidance, epidemic, infection, invulnerability, learning transfer, misconception, physical contact, transmission, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS)

INTRODUCTION

Human immunodeficiency virus (HIV) is the cause of acquired immune deficiency syndrome known as acquired immune deficiency syndrome (AIDS). As far as is known in medical history, it had no precedent prior to 1981, when it was discovered in the blood stream collected in 1959 (HIV AIDS, 2010; Wikipedia, 2013). The HIV makes an attachment on the white blood cells. Human immunodeficiency virus commonly referred to as HIV is used for maintaining immunity to disease. On contracting HIV, a person becomes vulnerable to diseases due to the weakening of the body immunity. From the time a person contracts HIV, he/she is infectious for the remaining of his lifespan (Mwamwenda, 2004; AIDS, 2013; Naswa and Marfatia, 2010). No wonder it has been asserted that

HIV/AIDS is the most dreaded disease in human history, and that while God forgives, HIV/AIDS does not (Mwamwenda, 204; AIDS, 2010; Wikipedia, 2013).

AIDS is a disease of the human immune system precipitated by HIV. It interferes with the body's system of resisting diseases, and therefore it is rendered rather feeble or powerless to infection. According to Summerfield (1990), AIDS is a condition that disempowers the body immune system from fighting diseases. As AIDS advances, the more the body succumbs to infection, which is referred to as opportunistic diseases that would not pose a threat to a non-HIV person.

In many parts of the world, HIV/AIDS has become a pandemic. Large areas are affected and the pandemic

continues to spread (Kibombo et al., 2007; Ebeniro, 2010; Janckie et al., 2011). According to Facents (2001), even though there has been a visible decline in conversion rate of HIV to AIDS, there has been an increase in the rate of contraction of HIV/AIDS. Since there is no cure, prevention remains the only sure way for combating the disease. Durojaiye (2009) reports that worldwide, 45% of people contracting HIV/AIDS are adolescents aged between 15 and 24 years. This is supported by other researchers who have found that adolescents aged 15 to 24 years constitute the largest population of HIV infected subjects (Szekeres, 2000; Milanzi and Komba, 2005; Ebeniro, 2010). In the USA, it is stated that adolescents constitute the largest HIV/AIDS invisible population (Szekeres, 2000). Present figures worldwide suggest there are 10.3 million HIV adolescents whose age range is from 15 to 24 (Naswa and Marfatia, 2010)

Given the challenge of HIV/AIDS that adolescents encounter, it is vital that their awareness of the risks associated with sexual behaviour is made clear, and the importance of applying this knowledge to real life experience (Njogu and Martin, 2003; Macintyre et al., 2004). Kabiru and Orpinas (2009) support this argument and state that, in view of the high rate of HIV in Sub-Saharan Africa, the quest for understanding forces that influence adolescent sexual behaviour is important. According to the African Population Health Research Center (2009), adolescence is an important period in human development where a person reaches sexual maturity, manifest in sexual engagement; thus encountering the possibility of contracting sexually transmitted diseases such as HIV. Kamala and Aboud (2006) conclude that adolescents who are at the most reproductive stage of their human development are more at HIV/AIDS risk than any other population group. For this reason and more, it deserves more attention in combating infection and transmission of HIV/AIDS.

The preceding narration partly served as a backdrop of the motivation to undertake an investigation of HIV/AIDS knowledge and high school adolescents in Kenya. Nevertheless, there is need to explore similar studies that have examined HIV/AIDS in association with adolescents, which will be briefly narrated in subsequent advocacy.

In 2003, Njogu and Martin studied Kenyan high school adolescents and found that their level of knowledge about HIV/AIDS was high, though it did not have transfer of learning in terms of their sex practices. Kabiru and Orpinas (2009a) undertook a similar study of 8,556 male and female adolescent high school students in Nairobi, Kenya, and that adolescents would benefit from sex education programmes because they become aware of the factors that predispose them to HIV/AIDS.

In an earlier study, Erikson et al. (1997) compared the HIV/AIDS knowledge of 326 Kenyan and 146 Swedish teenagers. Even though their level of knowledge was good, the spread of HIV/AIDS remained unaffected by

the survey. In a similar study, Kamala and Aboud (2006) investigated and assessed the knowledge about the prevention of HIV among 364 rural high school adolescents in Bukoba, Tanzania. The outcomes showed that 93% of the participants were familiar with the prevention of transmission, whereas 86% identified the mode by which transmission occurs. The number of males who had engaged in sexual intercourse was 63.5%, whereas that of females was 38.6%. Those who used condoms were 52.5%, with females being more than males. While their knowledge of HIV/AIDS was satisfactory and in some cases fairly high, the transfer of such knowledge in terms of sexual behaviour was rather low.

The African Population and Health Research Center (2009) carried out a huge study of 3,612 adolescents aged 12 to 25 years, randomly drawn from three types of secondary schools in Nairobi: single-gender, co-educational and both boarding and day secondary schools. Their knowledge of prevention of transmission was high but was not applied to their sexual behaviour practices, though a small number of them made transfer of such knowledge. For example, one fifth of sexually active boys used condom regularly; one third of the boys used condom irregularly, while others did not see the need for the use of condoms. It was therefore concluded that there was need for comprehensive sexuality education programmes, which equip adolescents to protect themselves against the scourge of HIV/AIDS.

Njogu and Martin (2003) investigated the persisting gap between HIV/AIDS and knowledge and prevention among Kenyan youth. This led to the conclusion that what is being advocated is: educating, motivating, persuading and enabling tactics should be the chief cornerstones of HIV/AIDS campaigns.

Kabiru and Orpinas (2009a) carried out a study of 3,556 male and female adolescent high school students in Nairobi, Kenya. Close to 50% of the males and 11% females reported being sexually active. The study concluded that adolescents would benefit from sex education programmes alerting them to the factors that predispose them to HIV/AIDS. In a similar investigation, Kabiru and Orpinas (2009b) made a study of correlation of condom use among 931 sexually active male high school students in Nairobi and their knowledge of HIV/AIDS. Of the total number of participants, 50% reported to be users of condoms. Their knowledge of HIV/AIDS was not significantly different. All participants were of the view that chances of contracting HIV/AIDS were rather low, if not non-existent.

According to Facente (2001), there has been a visible decline of the rate from HIV to AIDS, whereas there is increase in the contraction of HIV/AIDS. He further points out that, while adolescents are versatile regarding the risk and consequences of contracting HIV/AIDS, they still cling to the belief that personally they are unlikely to contract the disease. In a sample of 78 participants with a

mean of 15.9 years, 74% of the adolescents were deemed to have a good knowledge of HIV transmission. Of those who engaged in risk sexual activity, 80% of them did not think that they stood a chance of contracting HIV/AIDS.

Ayopo (2009) made a study of Nigerian adolescent students' perceptions of HIV/AIDS and their attitudes to prevention methods. The results were that the adolescents showed that they had positive perceptions and attitudes toward HIV/AIDS, and that they were also familiar with methods used for guarding against contracting HIV/AIDS. In another study, Durojaiye (2009) explored the Nigerian youth knowledge, perception and behaviour and practice in the City of Lagos. Their level of knowledge of HIV/AIDS stood at 8.3 out of 10 points. Close to 73.5% did not believe that they were at risk of contracting HIV/AIDS with those who had low perception of contracting HIV/AIDS, and there was no commitment to behaviour change.

In India, McManus and Dhar (2008) examined 251 adolescent high school girls' knowledge, perception and attitudes towards STI/HIV, safer sex and sex education in New Delhi. The knowledge that girls had regarding the transmission and prevention of HIV was good. About 22% of the participants did not believe that there was anything amiss with girls engaging in sex with boys, so long as they loved each other. There were 49% participants who thought condoms should not be made available to adolescents, as they foster their engaging in sex. It was their considered opinion that condoms are there for those who are married.

Singh and Jain (2009) also from India, studied secondary school adolescents' awareness of HIV/AIDS in the District of Gujarat. The sample comprised 755 participants drawn from 29 schools. Over 90% were familiar with the various ways HIV/AIDS is transmitted, and over 80% were familiar with various ways of guarding against its infection. Most participants were familiar with the knowledge that there is no cure for HIV/AIDS. There were also a few misconceptions reported that, HIV could be contracted as a result of mosquito bite and casual contact. Singh and Jain (2009) concluded their investigation by pointing out that sex education that includes HIV/AIDS would contribute to the lowering of HIV/AIDS transmission. This is particularly so for African adolescents (Mwamwenda, 2004). Macintyre et al. (2004) examined factors predicting risk perception. Their conclusion was that greater understanding of the correlation between adolescents and their community and adults in their lives is needed; programmes to change the environment influence adolescents opinion, make choices and act should all be part of the programme design. On the other hand, Lenono (2007) made a study of Love life counsellors' perception of the impact of HIV/AIDS on the sexual conduct of adolescents. The study aimed at examining the extent to which love life counsellors were of the view that Love life had an impact

on adolescents' sexual activity, and whether adolescents expressed their sexuality differently, as a result of HIV/AIDS. The study further investigated counsellors' perception of adolescents' use of condoms, being faithful to one partner and abstaining.

It was the view of the counsellors that adolescent had a change in their expression of sexuality, as a result of their awareness of HIV/AIDS. Such a change manifested itself by reduction in the adolescents' contracting HIV/AIDS. HIV/AIDS had impact on how adolescents conducted themselves sexually. Adolescents take seriously the danger of HIV/AIDS to one's life. Furthermore, they are adhering to the three principles of C-B-A standing for; Use of condom, Be faithful and Abstain. It was nevertheless noted that many adolescents find it rather difficult to abstain from sex altogether. According to Naswa and Marfatia (2010), an adolescent contracts HIV and remains infected and affecting others, so long as he/she lives. This is particularly so, as a result of the prolonged duration as a result of medical treatment, particularly by means of anti-retroviral. It was estimated that 36% male and 20% female had a comprehensive knowledge of HIV/AIDS. Comparatively, rural adolescents knew less about HIV than adolescents in rural areas.

Kibombo et al. (2007) reported that at one stage, there were 15% HIV/AIDS Ugandans, which as a result of intervention was reduced to 5%, an unprecedented success rate worldwide. Most of the decline on HIV infection was among adolescents aged 15 to 19 years. This is significant, taking into account that, in most parts of the world, adolescents aged between 15 to 24 years constitute the largest population of HIV infected persons (Durojaiye, 2009; Naswa and Marfatia, 2010).

In contrast, Kibombo et al. (2007) correctly argued that perception of being susceptible to contracting HIV/AIDS works as catalyst for undertaking the necessary precautionary measures for the prevention of HIV transmission. They undertook a study of 5,112 (from different parts of Uganda). Majority of participants perceived themselves to be vulnerable to HIV infection and guarded against engaging in sexual behaviour that would make them susceptible to contracting the disease. In the USA, Szekeres (2000) reports that adolescents aged 15 to 24 years constitute the largest HIV/AIDS invisible population. Over a decade ago, it was estimated that for every four American adolescents, one adolescent was infected with HIV/AIDS. Szekeres (2000) dares speculate that many American adults who are HIV/AIDS positive may have contracted the disease as they went through adolescence. Many of those infected with HIV are not even aware of their HIV status because they have not been tested. It is further pointed out that even those who have tested positive are not receiving the appropriate treatment for shortage of funds. Others are not receiving treatment, as a defence mechanism of denial that, they are not HIV infected regardless of what the tests may have shown.

The preceding review of literature and its various arguments informed the present investigation of HIV/AIDS knowledge and high school adolescents in Kenya. Apart from the knowledge of adolescents regarding HIV/AIDS, the investigation also examined the extent to which such knowledge informed the adolescents in cognitively predetermining their sexual practices.

METHODOLOGY

Sample

The study investigated 157 adolescent high school students consisting of 88 boys and 69 girls. Their age ranged between 16 to 18 years, drawn from two high schools in the City of Nairobi, Kenya. Participants were multilingual, as they spoke different ethnic languages spoken in Kenya. Their understanding of the English language used in the questionnaire was good. For the purpose of confidentiality, participants were not asked for their names or name of the school they were attending. They were, however, asked to indicate their gender and date of birth.

Instrument

A twenty-five statements questionnaire on their knowledge of HIV/AIDS was administered for their responses. Questionnaire addressed issues related to the transmission, infection and prevention of HIV/AIDS which has reached epidemic proportion among adolescents in Kenya and elsewhere in Africa and the world at large. For each statement/question on HIV/AIDS they were three possible answers. The participants were asked to tick the most appropriate response regarding their knowledge of HIV/AIDS. The options were either "Yes", "No", "Do not know".

Procedure

Two academics at the University of Nairobi were responsible for the collection of data. Permission to administer the questionnaire was sought from the Senior Management of the selected Schools. Following their consent, the questionnaire was administered after briefing participants that the questionnaire was to find out how much they knew about HIV/AIDS, and their participation was subject to their agreeing to participate.

Data analysis

Two statistical analyses were used for the purpose of determining the adolescents' knowledge about HIV/AIDS. The first approach was to examine the frequencies in terms of the responses made to the questionnaire. These were converted into percentages on the assumption that the higher the percentage was a reflection of how well informed the participants were about HIV/AIDS. The minimum score expected was 50% and above. The second analysis was based on chi-square contingency Table. Whether responses were statistically significant was dependent on whether the chi-square means difference was significant. In the analysis of data, only 19 questions/statement were used. Six were rejected because participants perceived and interpreted them incorrectly.

RESULTS

Table 1 is the results based on: frequencies, percentage,

chi-square and level of probability. The response to whether a subject would contract HI/AIDS if they shared a cigarette with an HIV/AIDS was negative in 92% of the answers. According to the χ^2 test (2df, N155) = 250, this was statistically significant with $p < 0.001$. When asked whether drinking from a glass used by an infected person would lead to contracting HIV/AIDS, 94% rejected this hypothesis with χ^2 (2df, N155) = 249, which was also significant with $p < 0.001$. The sharing of food with an HIV/AIDS person as a source of transmission was also rejected by 97%. This was further confirmed by the chi-square contingency Table χ^2 (2df, N155) = 277, $p < 0.001$. The use of a common toilet seat as source of HIV/AIDS was not accepted χ^2 (2df, N155) = 175, $p < 0.001$ as one of the ways of being infected with HIV/AIDS. The χ^2 (2df, N155) = 87, $p < 0.001$ which was significant. As regard kissing a person who is HIV/AIDS as source of infection, this was rejected by 66%. This was significant, χ^2 (2df, N155) = 136, $p < 0.001$. Taking care of an infected person as one of the ways HIV/AIDS can be transmitted was rejected by 76%. Calculation of χ^2 (2df, N155) = 210, $p < 0.001$ was significant.

There is a belief that one can contract HI/AIDS by sharing clothes with an infected person. The majority of participants (89%) did not think that was the case; χ^2 (2df, N155) = 231, $p < 0.001$. Getting blood transfusion from an infected person was accepted as a correct narration by 96%. Acceptance level was significant, χ^2 (2df, N155) = 114, $p < 0.001$. The same held true for engaging in sexual behaviour with a person who is infected which was accepted by 95% of the participants. The chi-square acceptance of the statement was significant, χ^2 (2df, 155) = 156 $p < 0.001$. Shaking hands with an infected person was not considered a source of transmission by 96%. This was significant, χ^2 (2df, N155) = 267, $p < 0.001$.

Mosquito bites were not considered as instrumental to being infected by 61%. Chi-square for those who reflected the role of mosquito in HIV/AIDS was χ^2 (2df, N155) = 63, $p < 0.001$. Whether there is a cure for HIV/AIDS, 75% did not think so. The rejection of the statement was χ^2 (2df, N155) = 63, $p < 0.001$. The belief that HIV/AIDS is God's punishment for engaging in sex out of wedlock was rejected by 57%, implying that the other 43% accepted that it was so. The chi-square was nevertheless significant in favour of the correct response, χ^2 (2df, N155) = 29.7, $p < 0.001$. Avoidance of HIV/AIDS persons was rejected by 63%. Avoidance of those who are infected was χ^2 (2df, N155) = 91, $p < 0.001$. Those taking a different stance was substantial. The chance of contracting HIV/AIDS was denied by 76% of the participants. The chi-square in terms of denial was χ^2 (2df, N155) = 210, $p < 0.001$.

Regarding the transfer of knowledge to sexual behaviour, participants responded to the question of whether there were attempts on their part to avoid having relationship with girls or boys for fear of HIV/AIDS transmission. The response showed that 96% of the

Table 1. Participants' correct responses frequencies, percentage, chi-squares and probability N = 366.

No.	Statement	Kenya N=102				South Africa N=164				Tanzania N=100			
		Freq	%	χ^2	P	Freq.	%	χ^2	P	Freq.	%	χ^2	P
2	Sharing cigarette with AIDS person	81	79	97.5	0.001	148	90	245	0.001	85	85	115	0.001
3	Sharing a cup with AIDS person	87	85	123.6	0.001	150	93	253.7	0.001	84	84	121	0.001
4	Sharing food with infected person	100	98	121.6	0.001	156	95	290.7	0.001	87	87	135.5	0.001
5	Using same toilet seat AIDS person	88	86	125.7	0.001	143	87	207	0.001	85	85	121.7	0.001
6	Kissing an AIDS person	43	42	32	0.001	133	81	173	0.001	61	61	43	0.001
7	Taking care of AIDS person	98	96	81	0.001	127	77	185.6	0.001	68	68	47.6	0.001
9	Sharing clothes with AIDS person	93	91	153.9	0.001	138	84	201	0.001	77	77	102.7	0.001
10	Blood transfusion from AIDS person	102	100	136	0.001	150	91	264	0.001	100	100	136	0.001
11	Having sex an infected person	102	100	120.5	0.001	149	91	255	0.001	100	100	136	0.001
12	Shaking hands with AIDS person	98	96	152.5	0.001	149	91	252.5	0.001	-	-	-	-
13	Mosquito bite	88	86	108	0.001	76	46	59.6	0.001	-	-	-	-
14	There is no cure for AIDS	82	80	94.8	0.001	114	70	125.7	0.001	88	88	76.7	0.001
16	AIDS is punishment for engaging in sex outside marriage	52	51	14.5	0.001	92	56	43.5	0.001	71	71	68	0.001
17	AIDS persons should be avoided	94	92	113.4	0.001	115	70	117	0.001	80	80	102	0.001
21	Stand a chance of Contracting AIDS?	56	55	21	0.001	33	20	42.7	0.001	22	22	8.6	0.001
22	Careful in relationship with gender counterpart to avoid AIDS	98	96	80.5	0.001	144	88	240.9	0.001	73	73	74.5	0.001
23	Should AIDS children be in the same school with those who do not have AIDS?	73	72	73	0.001	105	64	86	0.001	67	67	70	0.001
24	Would you sleep with an AIDS person?	43	42	44.4	0.001	92	56	77	0.001	49	49	23	0.001
25	Would you sit next to an AIDS person?	83	81	207	0.001	143	87	219	0.001	67	67	57	0.001

participants were positive. Being careful in relationship to avoid transmission of HIV/AIDS χ^2 (2df, N155) = 268, $p < 0.001$. Such an overwhelming response was distinct in comparison to the contrary that has been reported repeatedly that there lack a correlation between HIV/AIDS knowledge and application to sexual behaviour.

In response to the question whether HIV/AIDS children should attend school with uninfected children, 73% participants ticked a positive response. Joint school attendance was χ^2 (2df, N155) = 63, $p < 0.001$. Whether one would share a bed with an HIV/AIDS person, the response of 59%

respondents was that there would be no problem doing so. Sharing a bed with an infected person was χ^2 (2df, N155) = 63, $p < 0.001$. Considerable proportion of respondents would not be prepared to do so. The last question sought to find out whether participants would feel comfortable sitting next to an HIV/AIDS person, to which 88% said they would have no problem doing so. Those who agreed to sitting next to an HIV/AIDS person was χ^2 (2df, N155) = 202, $p < 0.001$, which was statistically significant. In summary, there is clear evidence that the majority of participants had a high level of knowledge regarding HIV/AIDS. For

the 19 questions/statements on the questionnaire, there were only three questions where the level of statistical significance was on the side of the wrong answers. It was significant to note that there was transfer of knowledge to sexual behaviour. This conclusion is based on the response that participants indicated that they were careful in their relationship with members of the opposite sex for fear of HIV/AIDS transmission.

DISCUSSION

Given that there is no cure for AIDS and the

devastating danger HIV/AIDS poses to human life, numerous studies have been carried out globally to identify various ways by which the transmission and infection of HIV/AIDS can be controlled, if not arrested to halt the carnage that has resulted in the millions of people around the world who have lost their lives. One of the most common ways has been based on public education in awareness, perceptions, attitudes and beliefs. This has been undertaken in the belief that a result of being knowledgeable about HIV/AIDS will lead people to guarding themselves against behaviour that would predispose them to the transmission of HIV/AIDS (Njogu and Martin, 2003; Macintyre et al., 2004; Lenono, 2007; Durojaiye, 2009).

It was in this context that the present investigation sought to establish the extent to which high school adolescents in Nairobi Kenya were knowledgeable about HIV/AIDS, and whether such level of knowledge would be related to their avoidance of behaviour associated with the spread of HIV/AIDS. Based on the findings of the present study, it was clear that most participants' knowledgeability ranged from 50% to over 90%, which is very similar with other studies reported in Kenya, Sub-Saharan Africa, India and the USA (Kibombo et al., 2007; McManus and Dhar, 2008; African Population Health Research Center, 2009; Ayopo, 2009; Naswa and Marfatia, 2010; Sutton et al., 2011). The investigation further examined the extent to which knowledge of HIV/AIDS was related to participants' sexual behaviour. Like and unlike other studies, the participants who had a high level of knowledge on HIV/AIDS matched the number of those who had a transfer of knowledge of HIV/AIDS to their being careful in their relationship with their gender counterparts, as a way of avoiding being HIV/AIDS infected (Summerfield, 1990; Kamala and Aboud, 2006; Lenono, 2007; Mwale, 2008; Singh and Jain, 2009).

There was nevertheless, a difference in the way some of the responses were given. For example, in response to the question of whether participants considered themselves vulnerable to being HIV/AIDS infected, the majority of respondents were more negative than positive, which according to the expected response was wrong. On the other hand, such a response did not come as a surprise, since similar responses have been reported in the literature, in the majority of cases (Njogu and Martin, 2003; Kabiru and Orpinas, 2009; Durojaiye, 2009; Opt et al., 2010). Though with responses to whether AIDS is a punishment from God; avoiding HIV/AIDS persons as far as possible and mosquito bite being a source of infection, correct responses were statistically significant, the difference was rather marginal compared to incorrect responses. Moreover, even where the overwhelming majority of participants had excellent knowledge of HIV/AIDS, the scores were not 100% correct. This means there were participants who did not have the expected knowledge of HIV/AIDS, thus justifying further and better strategies of public education on HIV/AIDS.

This is in line with what other researchers have reported in their findings (Njogu and Martin, 2003; Macintyre et al., 2004; Durojaiye, 2009; Singh and Jain, 2009; Jankie et al., 2011; Sutton et al., 2011).

CONCLUSION

In summary, there is clear evidence that the majority of participants were very knowledgeable about HIV/AIDS, which is similar to what other researchers have reported from time to time. But this is not void of misconceptions on a number of questions, signifying the continued effort in the spread of public education among high school adolescents. It has also been reported that participants indicated that based on their HIV/AIDS knowledge, they are careful in their relationship with boys/girls, lest they contract HIV/AIDS. This is rather gratifying, given that this has been a less frequently reported phenomenon in the HIV/AIDS research literature.

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