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**The mental health of people
living with HIV/AIDS in Africa:
A systematic review**

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Abstract:

This paper reviews published quantitative research on the mental health of HIV-infected adults in Africa. Twenty-seven articles published between 1994 and 2008 reported the results of 23 studies. Most studies found that about half of HIV-infected adults had some form of psychiatric disorder, with depression the most common individual problem. PLWHA tended to have more mental health problems than non-infected individuals, with those experiencing lower levels less likely to be poor and more likely to be employed, educated and receiving ART. Being female, experiencing poor health, receiving poor quality health services, and a lack of material and emotional support from family and friends were associated with greater psychiatric morbidity. While some key findings emerged, the knowledge base was diverse and methodological quality uneven, thus studies lacked comparability and not all findings were equally robust. Further, more rigorous research is needed in order to put mental health services for PLWHA in Africa on the healthcare agenda. Priorities for future research should include replicating findings regarding common mental health problems amongst PLWHA, issues for HIV-infected women, and the longer-term mental health needs of those on ART. Research is also needed into predictors of mental health outcomes and factors associated with adherence to ART which can be targeted in interventions.

While mental health has long been neglected in developing countries, the HIV/AIDS pandemic has drawn increasing attention to the need to address mental health as a global health concern (Desjarlais, Eisenberg, Good, & Kleinman 1995; Freeman, Patel, Collins, & Bertolote 2005; Saxena, Thornicroft, Knapp, & Whiteford 2007). Research has shown several links between HIV and mental health, including higher rates of mental illness amongst people living with HIV/AIDS (PLWHA). However, the evidence-base is largely from the developed world (Baingana, Thomas, & Comblain 2005), and research from developing countries remains limited (Collins, Freeman, & Patel 2006).

Addressing this gap in all developing countries is clearly an important area of research. However, it is those living in Africa who constitute the large majority of people infected with HIV. UNAIDS figures show that sub-Saharan Africa alone is home to more than two out of every three HIV-infected adults, globally, and as many as 90% of infected children (UNAIDS 2007). It is important to assess whether PLWHA in Africa are at risk of related mental health sequelae.

The aim of this paper is to provide a systematic review of research on the mental health of HIV-infected adults in Africa¹. It focuses on quantitative research in order to identify the scale and nature of mental health problems for those infected. The paper will present available evidence on the prevalence of psychiatric morbidity and distress in this population, as well as considering the levels of morbidity relative to non-infected populations and the factors which predict morbidity in PLWHA. In addition to synthesising the available evidence base, the review will evaluate the evidence in terms of its methodological rigour. Areas for further research will also be identified.

Search strategy

The review draws on all published, English-language studies available up to April 2008. Studies were largely identified using keyword searches of electronic databases as well as scanning the reference lists obtained through these sources. Databases sourced were: PsycINFO, PsycARTICLES, Academic Search Premier, Medline, Sociological Abstracts, Science Direct, ISI Web of Science, PubMed, Index to South African Periodicals and South African ePublications. Keywords used were HIV, AIDS, mental health, psychological, depression and anxiety.

¹ Although sub-Saharan Africa is the epicentre of the HIV/AIDS pandemic, literature from North and West Africa have been included since the body of research is so small.

In order to be included, studies had to employ quantitative methods, sample adults only (defined as those over 18 years), and attempt to ascertain the HIV status of participants termed HIV positive, even if by self-report. Studies of mental health in high HIV prevalence areas which did not specify participant's HIV status were excluded. Single case reports were also excluded as they do not contribute substantially to the broader epidemiological enquiry regarding prevalence.

Issues of method

The search identified 23 studies, the results of which are reported in 27 articles published between 1994 and 2008. Half of the papers (14 out of 27) were published after 2005 and just over a third (10 out of 27) after 2006, suggesting increased attention to mental health issues amongst PLWHA in the region. However, while the number of studies has increased, the body of research remains fragmented and the methodological quality uneven. Consequently, not all findings can be considered equally robust and comparability is limited. (See Table 1 for an overview of studies).

Lack of comparability

Several characteristics of the research limit comparability. Firstly, very little country-specific data is available, with the exception of South Africa where 11 studies have been conducted. Three studies have been conducted in Uganda and Kenya, and only one in each of the Democratic Republic of the Congo (DRC), Senegal, Nigeria, Tanzania, Zambia, Angola and Zimbabwe.

Second, several studies focus on specific sub-populations within PLWHA. Consequently, findings constitute a point of departure rather than being directly relevant to the experiences of the wider population of PLWHA in the particular community or country. For example, five studies investigated the experiences of pregnant women infected with HIV (Mfusi & Mahabeer 2000; RoCHAT *et al.* 2006; Collin *et al.* 2006; Bernatsky, Souza, & De Jong 2007; Antelman *et al.* 2007), while one was conducted with employees of the food and beverage industry at a workplace clinic in Kenya (Carson *et al.* 1998). Five other studies sourced some or all participants from AIDS-related NGOs or support services for PLWHA and may therefore exclude those whose mental health is at risk due to a lack of material or emotional support (Kaharuza *et al.* 2006; Reece *et al.* 2007; Adewuya *et al.* 2007; Stangl *et al.* 2007; Freeman, Nkomo, Kafaar, & Kelly 2007). Most studies, however, sampled the more impoverished sectors of

Table 1. Overview of published quantitative research on the mental health of HIV-infected adults in Africa

Reference	Study site	Study design	Sample	Outcome	Instrument(s)
Myer et al. (2008)	South Africa; HIV clinics	Cross-sectional	465 HIV+ adults; 75% female; 63% CD4>200; 48% on ART; median time since diagnosis 29mnths. Consecutive sampling.	Depression, PTSD, alcohol use, psychiatric morbidity	CES-D, HTQ, AUDIT, MINI, Life Events Checklist
Adewuya et al. (2007)	Nigeria; HIV support centre, community sample	Cross-sectional with control group	175 adults (88 recently diagnosed HIV+, 87 HIV-); 46% female; 59% asymptomatic; % on ART not specified; time since diagnosis <1mnth. Probability sampling of centre registry.	Psychiatric morbidity	MINI
Antelman et al. (2007), Kaaya et al. (2002)	Tanzania; antenatal clinics	Longitudinal and validation study	996 HIV+ pregnant women; assessed post HIV test and (median) 5 times over 6yrs; 82% WHO stage I at enrolment; % on ART not specified. Sampled subset of RCT.	Depression, anxiety	HSCL-revised version
Bernatsky et al. (2007)	Angola; HIV and rural antenatal clinics	Cross-sectional with comparison group	157 pregnant women (23 HIV+, 134 not known to be HIV+); 67% asymptomatic; 17% on HAART; time since diagnosis not specified. Consecutive sampling.	Psychological distress	GHQ-12
Booyesen et al. (2007)	South Africa; HAART programmes	Cross-sectional	371 HIV+ adults on HAART; nearly 66% female; disease stage and time since diagnosis not specified. Random sampling.	Quality of life	3 quality of life measures – none named
Freeman et al. (2007)	South Africa; clinics, NGO	Cross-sectional	900 HIV+ adults; 74% female; disease severity and time since diagnosis varied (specifics not given), 18% on ART. Consecutive sampling.	Psychiatric morbidity	CIDI
Poupard et al. (2007)	Senegal; exact site not specified	Cross-sectional	200 HIV+ adults on HAART for >6mnths; 64% female; 54% CD4 <300; time since diagnosis not specified. Consecutive sampling.	Depression, quality of life	CES-D; question re. quality of life
Reece et al. (2007)	Kenya; support group	Cross-sectional	397 HIV+ adults; 72% women; 43% AIDS; % on ART not specified; mean time since diagnosis 28mnths. Volunteers recruited	Psychological distress	BSI

Reference	Study site	Study design	Sample	Outcome	Instrument(s)
Simbayi et al. (2007)	South Africa; social, health services	Cross-sectional	1063 HIV+ adults; 60% female; 50% >7 AIDS symptoms, 50% on ART, mean time since diagnosis 2.7yrs. Volunteers recruited.	Depression	CES-D; items re. drug use
Stangl et al. (2007)	Uganda; AIDS service organisations	Longitudinal	947 HIV+ adults on HAART; followed-up 1yr; 75% female; 45% WHO stage I; time since diagnosis not specified. Volunteer recruitment through AIDS organisation and RCT.	Quality of life	MOS-HIV
Collin et al. (2006)	Zambia; antenatal clinic	Longitudinal with control group	272 ¹ pregnant women (138 HIV+, 134 HIV-); assessed before delivery, 7days, 6wks postpartum; tested for study. Consecutive sampling.	Psychological distress	SRQ-20
Kaharuza et al. (2006)	Uganda; AIDS NGO	Cross-sectional	1017 HIV+ adults undergoing ART screening; 77% female; 16% CD4>500; 39% 200-499; time since diagnosis not specified. Sampled subset of RCT.	Depression	CES-D
Olley et al. (2006b, 2005, 2004a, 2004b)	South Africa; infectious diseases' clinic	Longitudinal	149 HIV+ recently diagnosed adults; 65 at 6mth follow-up; 70% female (79% at follow-up); 50% asymptomatic; 1% on ART; mean time since diagnosis 6mnths. Consecutive sampling.	Psychiatric morbidity	MINI
Rochat et al. (2006)	South Africa; antenatal clinics	Cross-sectional with control group	242 rural pregnant women undergoing HIV testing; 99 tested HIV+, 143 HIV-; disease severity not specified. Consecutive sampling.	(Postnatal) depression	EPDS
Jelsma et al. (2005)	South Africa; HAART programmes	Longitudinal with comparison group	117 HIV+ adults on HAART (less at 1yr follow-up); 70% female; followed-up for 1yr; all WHO stage 3 or 4; time since diagnosis not specified. Consecutive sampling.	Quality of life	EQ-5D (Quality of life scale)
Shisana et al. (2005)	South Africa; community survey	Cross-sectional with comparison group	689-1010 HIV+ and HIV- youth and adults; approx. 51% female ² ; disease severity and use of ART not specified; tested as part of study. Random sample of national survey.	Psychological distress	Adapted CIDI screening section

Reference	Study site	Study design	Sample	Outcome	Instrument(s)
Mast et al. (2004)	Uganda; community survey	Cross-sectional with control group	803 rural mothers of young children (239 HIV+, 564 HIV-); 79% 1/more symptom AIDS; use of ART and time since diagnosis not specified. Consecutive sample of HIV+ and random sample of HIV- from cohort study.	Quality of life	Culturally adapted version of MOS-HIV
Sebit et al. (2003)	Zimbabwe; community sample	Cross-sectional with control group	194 adults (115 HIV+, 79 HIV-); 73% female; 47% asymptomatic; none on ART; time since diagnosis not specified. Consecutive sample of self-reported HIV+ and household survey of status unknown (tested and stratified).	Psychiatric morbidity, depression	Sections of revised CIDI, BPRS, AUDIT, MADRS, MMS
Mfusi & Mahabeer (2000)	South Africa; antenatal clinic	Cross-sectional with control group	60 pregnant women (30 HIV+, 30 HIV-); disease severity, use of ART and time since diagnosis not specified. Randomly selected from lists given by staff.	Depression, anxiety	IPAT Anxiety Scale, BDI
Els et al. (1999)	South Africa; immunology clinics	Cross-sectional	100 HIV+ adults; 57% female; 73% CD4>200; none on ART; median time since diagnosis 1yr. Sampling strategy unclear.	Psychiatric morbidity, anxiety	MINI, Hamilton and Zung Anxiety Scales
Carson et al. (1998)	Kenya; clinic for food industry employees	Cross-sectional with control group	215 working adults (77 HIV+, 138 HIV-); 23% female; HIV status tested anonymously as part of study; disease severity not specified. Consecutive sampling.	Psychiatric morbidity, neuro. functioning	CIS-modified version, Neuro. battery
O'Keefe & Wood (1996)	South Africa; HIV clinic	Cross-sectional with comparison group	248 adults (134 HIV+, 114 in untested comparison group); 40% female; 40% WHO stage 1/2; use of ART and time since diagnosis not specified. Consecutive sampling.	Quality of life	MOS SF-36
Maj et al. (1994)	Zaire and Kenya; outpatient clinics	Cross-sectional with control groups	Zaire: 205 adults (120 HIV+, 85 HIV-); 43% female; 68 symptomatic, 52 asymptomatic; Kenya: 203 adults (138 HIV+, 65 HIV-); 32% female; 72 symptomatic, 66 asymptomatic; use of ART not specified; tested prior to study but specifics re. time since diagnosis not reported. Recruited every 3 rd eligible attendee.	Psychiatric morbidity, psychological distress, depression	CIDI, BPRS, MADRS

Notes:

The term “control group” refers to a group in which HIV (negative) status has been verified, while a “comparison group” is a reference group from the community or elsewhere in which HIV status has not been verified.

“Psychological distress” is used to denote an overall psychological state based on self-report rating scales, while “psychiatric morbidity” indicates the use of a standardized, interviewer-administered tool to assess general psychological functioning.

HSCL=Hopkins Symptom Checklist; GHQ=General Health Questionnaire; SRQ=Self-Reporting Questionnaire; MINI=MINI International Neuropsychiatric Interview; EPDS=Edinburgh Postnatal Depression Scale; MOS-HIV=Medical Outcomes Study Health Survey-HIV; BDI=Beck Depression Inventory; CES-D=Centre for Epidemiologic Studies Depression Scale; HTQ=Harvard Trauma Questionnaire; AUDIT=Alcohol Use Disorders Identification Test; CIDI=Composite International Diagnostic Interview; BSI=Brief Symptom Inventory; BPRS=Brief Psychiatric Rating Scale; MADRS=Montgomery Asberg Depression Rating Scale; CIS=Clinical Interview Schedule; MOS SF-36=Medical Outcomes Study 36 item Short Form Health Survey; MMS=Mini Mental State; HAART=Highly Active Antiretroviral Therapy; ART=antiretroviral therapy; RCT=randomised controlled trial; neuro=neuropsychological

1. This reflects only the subset of the total sample for which data on psychiatric (as opposed to physical) morbidity was reported by the authors.

2. Details regarding the sub-sample to which the five mental health proxy measures were administered are unclear from the report and different sample sizes are reported for each of the five questions (see pp. 109-111). Shisana et al. also caution that some of the participants who reported their status as HIV negative may have tested positive during anonymous testing.

the community who utilise public health services and are often unemployed. These are to a large extent the characteristics which define those infected with HIV and AIDS in Africa.

Third, not all studies reported the HIV-related characteristics of participants. One out of three studies did not specify participants’ stage of illness and only half of the studies specified the time since participants were diagnosed HIV-positive, with a range from a few weeks to two and a half years. Disease severity is potentially important information with which to interpret findings given that mental health may shift over time in relation to HIV-related events such as the onset of AIDS opportunistic infections (Kalichman 1995).

Fourth, a broad range of instruments were used to assess mental health. Nine of the 23 studies employed standardised clinical diagnostic instruments and reported data for a range of psychiatric disorders, overall morbidity and comorbidity. The use of self-report scales was much more common. However, very few self-report scales have been used in more than one study. Exceptions were the Centre for Epidemiologic Studies Depression Scale (CES-D) which was used in five studies, and the Montgomery-Asberg Depression Rating Scale (MADRS) and the Alcohol Use Disorders Identification Test (AUDIT) which were each used in two studies.

Methodological rigour and quality of research

With regard to the rigour of the research, only 8 out of 23 studies employed a control group. Four studies employed comparison groups of some kind – either reference groups from the community or groups in which HIV negative status was self-reported or undetermined. However, given the high prevalence of HIV in many of the research communities, it is highly likely that a proportion of individuals within the comparison groups were HIV-infected and therefore failed to serve as an adequate control for HIV status.

Studies which employed a randomised approach to sample selection were also in the minority (5 out of 23 studies). Consecutive sampling was the most commonly used method (13 out of 23 studies), with other studies employing volunteer recruitment or household or community surveys. While randomisation best ensures the representivity of study samples, it is not always feasible. Volunteer recruitment through established HIV health and social services is clearly the simplest and most affordable option available to mental health researchers. However, this may result in samples which fail to include those who have not undergone testing, those who elect not to utilise those services as well as those who are the most ill and unable to attend services. The association between the uptake of services and mental health would need to be tested empirically.

The cultural relevance and validity of instruments developed outside of Africa for research within Africa is another issue which bears on research quality. Three studies with PLWHA have addressed this problem empirically: one adapted a quality of life scale culturally for use in Uganda (Mast *et al.* 2004); another demonstrated the validity of a depression inventory with HIV-infected pregnant women in Tanzania (Kaaya *et al.* 2002; Myer *et al.* 2008); and the third established that brief self-report scales provided valid proxies for common mental disorders amongst PLWHA in South Africa (Myer *et al.* 2008). In addition to these technical issues, researchers may be compelled to employ or adapt instruments developed elsewhere, especially where resources to develop instruments locally are lacking. Where the selected instruments have been administered (if not developed) with local populations previously, some comparability across studies is at least ensured (Cluver & Gardner 2007).

Results

The prevalence of mental health problems

There are clearly methodological issues in the available research. However, the body of research points to high levels of psychiatric morbidity amongst HIV-infected men and women residing in Africa, as it does in other parts of the world. Four studies employing comparable methodologies reported that approximately half of PLWHA have some form of psychiatric disorder, with figures ranging from 44 to 58% (Els *et al.* 1999; Olley *et al.* 2004a; Olley 2006; Olley, Seedat, & Stein 2006; Adewuya *et al.* 2007; Freeman *et al.* 2007). Two out of three pregnant HIV-infected women in Angola reported experiencing significant emotional stress (Bernatsky *et al.* 2007). Levels were even higher in a Zimbabwean sample, with nearly 75% of HIV-infected adults exhibiting psychiatric morbidity (Sebit *et al.* 2003).

Amongst the mental health problems found in PLWHA, depression appears to be the most common. Several studies reported rates of clinical disorder or depressive symptoms above levels expected for non-infected populations. Rates for clinical disorder were mostly above 20%, with Els *et al.* (1999) and Olley *et al.* (2004b) reporting rates of 35% and Sebit *et al.* (2003) 27%. Depressive symptoms were also prevalent, with most studies reporting rates of over 30% and as high as 64% (Mfusi & Mahabeer 2000; Sebit *et al.* 2003; Shisana *et al.* 2005; Kaharuza *et al.* 2006; Rochat *et al.* 2006; Simbayi *et al.* 2007; Stangl *et al.* 2007). In one of the few large-scale longitudinal studies conducted with an HIV-infected population in Africa, Antelman *et al.* (2007) found that more than half of HIV-positive pregnant women in Tanzania were depressed at some point during their pregnancy or the first year following the birth of their child. Moreover, of this 57%, 37% were depressed both antenatally and postpartum.

Levels of other psychiatric problems have also been investigated, with the most research available on anxiety, substance use and posttraumatic stress. Amongst a recently diagnosed population of HIV-infected adults in Nigeria, Adewuya *et al.* (2007) reported that 34% of individuals had some form of anxiety disorder. Other reports of high levels of anxiety-related symptoms or specific anxiety disorders such as panic disorder or generalised anxiety disorder range from 19 to 37% (Els *et al.* 1999; Mfusi & Mahabeer 2000; Sebit *et al.* 2003; Shisana *et al.* 2005).

Research has also shown that between 7 and 16% of PLWHA reportedly either abuse or are dependent on alcohol or other substances (Olley *et al.* 2004a; Adewuya *et al.* 2007; Freeman *et al.* 2007; Myer *et al.* 2008).

The findings regarding posttraumatic stress disorder (PTSD) are, however, more varied. Three studies conducted in South Africa reported rates of 5% (Myer *et al.* 2008), 4% (Freeman *et al.* 2007) and 15-29% (Olley, Zeier, Seedat, & Stein 2005; Olley *et al.* 2006). Other forms of mental disorder have been investigated too infrequently to merit comment, with the possible exception of Olley *et al.*'s (2006) finding regarding suicidality. The study conducted in South Africa reported that almost 9% of adults diagnosed not more than six months previously experienced suicidal feelings and 6% reported such feelings at a six-month follow-up. This finding would need to be investigated further in future research with other populations.

A number of studies (7 out of 23) have examined PLWHA who are in stronger socio-economic, social or medical positions than most HIV-infected Africans. This included those who were employed or in middle income groups (Carson *et al.* 1998; Collin *et al.* 2006); had high levels of tertiary education (27%) (Collin *et al.* 2006); were older and married (Poupard *et al.* 2007); or were attending HIV-related support services (Reece *et al.* 2007). The study participants were also more likely than most Africans to be receiving ART and for longer periods of time (Booyesen *et al.* 2007; Poupard *et al.* 2007; Myer *et al.* 2008).

The difference in populations may be reflected in the lower rates of disorder prevalence amongst these studies. Collin *et al.* (2006) reported 23% morbidity antenatally amongst a group of HIV-infected pregnant women in Zambia, and still lower levels antenatally (less than 5%). In a recent South African study, Myer *et al.* (2008) found that 19% of infected adults were either depressed, had PTSD or abused alcohol, while Reece *et al.* (2007) and Maj *et al.* (1994) found a less than 7% prevalence of significant distress and a 5-11% lifetime prevalence of psychiatric morbidity. Carson *et al.* (1998), Poupard *et al.* (2007) and Myer *et al.* (2008) have also reported rates of depression of 12-18%, compared with levels of nearer 30% in most other studies, while Maj *et al.* found even lower levels. Levels of anxiety were low (Maj *et al.* 1994; Carson *et al.* 1998) and levels of 'happiness'² were similar to those in the general population (Booyesen *et al.* 2007).

² Happiness was theorised as a component of overall quality of life along with overall life satisfaction, and was assessed using a non-standardised two-item scale.

Comparative levels of mental health problems amongst PLWHA

Research suggests that PLWHA in Africa have more mental health problems than non-infected individuals or the general population. HIV-infected adults were more likely to experience depression, PTSD, anxiety, psychosis, alcohol abuse and poorer quality of life (O'Keefe & Wood 1996; Els *et al.* 1999; Sebit *et al.* 2003; Jelsma *et al.* 2005; Shisana *et al.* 2005; Adewuya *et al.* 2007). PLWHA also continued to report poorer quality of life than a matched community sample despite improvements after three months on ART (Jelsma *et al.* 2005). Amongst HIV-infected women, greater anxiety, greater overall morbidity and poorer self-perceived quality of life was reported by those who were pregnant (Mfusi & Mahabeer 2000; Bernatsky *et al.* 2007). Poorer quality of life was also reported by HIV-infected women in general (Mfusi & Mahabeer 2000).

Three studies with adults and three with pregnant women have, however, failed to find greater mental health problems amongst PLWHA. Research with adults found equal or almost equal levels of anxiety (Shisana *et al.* 2005), neuropsychological functioning (Carson *et al.* 1998), and current and lifetime psychiatric morbidity (Maj *et al.* 1994; Carson *et al.* 1998). Amongst pregnant women, rates of depression (Mfusi & Mahabeer 2000; Rochat *et al.* 2006) and rates of overall morbidity (both antenatally and postpartum) were similar amongst infected and non-infected women (Collin *et al.* 2006).

More controlled studies are needed to replicate these findings. However, it is apparent that several of the studies which failed to detect greater levels of mental health problems amongst PLWHA had methodological weaknesses (untested comparison groups, unstandardised instruments) (Shisana *et al.* 2005) or were conducted with sub-populations which may have quite different experiences from most Africans living with HIV (pregnant women, employed) (Carson *et al.* 1998; Mfusi & Mahabeer 2000; Rochat *et al.* 2006; Collin *et al.* 2006). Maj *et al.*'s (1994) findings should not be easily dismissed given the rigour of the study. However, the research may represent a much earlier period than other reviewed studies when the African epidemic was at a less advanced stage, and thus mental health consequences may have been less prevalent.

Factors associated with mental health problems in PLWHA

Research from Africa indicates several psychosocial and health-related factors which are associated with higher levels of mental health problems in PLWHA. Further, certain socio-demographic characteristics are associated with greater psychiatric morbidity, and may therefore point to those within African populations who are at greater risk for poor mental health.

The role of health and treatment-related factors

Most of the available research on PLWHA indicates that higher prevalence of mental health problems are associated with poorer health, poor quality of health services, and either not accessing ART or being on treatment for shorter periods. The findings regarding time since diagnosis are unclear and should be examined in further research (Els *et al.* 1999; Booysen *et al.* 2007; Myer *et al.* 2008).

Greater disease severity, as assessed by more advanced clinical stage, lower CD4 count, higher viral load or a higher number of physical symptoms, has been associated with poorer quality of life as well as higher levels of overall morbidity, clinical depression, dysthymia, suicidality, and self-reported depression and anxiety (Mast *et al.* 2004; Kaharuza *et al.* 2006; Olley 2006; Adewuya *et al.* 2007; Freeman *et al.* 2007). Moreover, Olley and colleagues reported that disability or impairment in work predicted PTSD amongst women, while the extent of disability experienced in general was the best and most consistent predictor of depression, dysthymia and PTSD in multivariate analysis (Olley 2006; Olley *et al.* 2006). The relationship between disability and PTSD and depression also held at a six-month follow-up, suggesting that it may be fairly robust (Olley *et al.* 2006).

A smaller number of studies have reported different findings. Adewuya *et al.* (2007), for example, failed to find an association between having a psychiatric disorder and previous hospitalisation due to HIV. Collin *et al.* (2006) reported that physical morbidity was not associated with antenatal or post-partum mental morbidity amongst HIV-infected pregnant women. Other studies failed to find a relationship between disease severity and overall morbidity (Maj *et al.* 1994; Olley 2006), or reported less problems during advanced stages and more during earlier stages of HIV disease. Els *et al.* (1999) reported higher rates of depression and dysthymia in early stage disease; Olley *et al.* (2006) reported that PTSD was less common in more symptomatic individuals; and Reece *et al.* (2007) found that men were less distressed at more advanced stages of disease.

Women in Reece *et al.*'s study were, however, more distressed at advanced stages of disease.

With the increased availability of ART to PLWHA in Africa, research has begun to investigate the impact of treatment on mental health. Research has reported an association between treatment and depression, with PLWHA with a recent major depressive episode less likely to be taking ART (Myer *et al.* 2008). However, no causal relationship can be inferred. Higher levels of quality of life were also reported by patients who had been on treatment for at least three months (Jelsma *et al.* 2005; Booysen *et al.* 2007), with improvements continuing for between six and nine months before levelling off (Jelsma *et al.* 2005; Stangl *et al.* 2007). Two studies failed to find an association between having a psychiatric disorder and receiving ART and the length of time on ART. However, Freeman *et al.* (2007) did not record the length of time participants had been receiving ART and Adewuya *et al.*'s (2007) participants had only recently commenced treatment. It is therefore possible that mental health benefits would have been detected had the duration of treatment been assessed and had patients been on treatment for a longer period of time. This is further supported by the finding that improvements in quality of life were associated with experiencing improved health while on treatment and not accessing treatment *per se*. Perceived quality of health care was also a determinant of quality of life (Booyesen *et al.* 2007), while perceived discrimination in accessing healthcare following an HIV diagnosis was associated with depression amongst pregnant women (Rochat *et al.* 2006).

The role of psychosocial factors

Evidence regarding the influence of psychosocial factors on mental health is much more fragmented and the conclusions which can be drawn are therefore limited. However, three studies have variously demonstrated the value of informal social support for PLWHA. Poorer levels of social support have been associated with dysthymia, poorer quality of life and higher levels of overall morbidity (Olley, Seedat, Nel, & Stein 2004b; Adewuya *et al.* 2007; Booysen *et al.* 2007). Further, amongst HIV-infected women, lack of satisfaction with social support from family predicted dysthymia (Olley 2006). Only one study has investigated the role of more formal kinds of support (counselling, support groups and HIV-related organisations) and failed to demonstrate an association with mental health amongst HIV-infected adults in South Africa (Freeman *et al.* 2007). Having a mental disorder was not associated with having pre- and post-test HIV counselling, who one had counselling with, how many sessions one had with the counsellor; the number of times one attended a support group, whether or not one was still attending a support group; or involvement in an HIV-related

organisation (Freeman *et al.* 2007). There was also no relationship between mental health and levels of religiosity. However, it may be that the quality and perception of formal HIV-related support, rather than the mere availability and accessing of these supports, is what influences mental health.

Other research focusing on HIV-infected women suggests further risk factors for poor mental health. Amongst pregnant women, an unplanned pregnancy was associated with depression (Rochat *et al.* 2006), while women who were at-risk for psychiatric morbidity antenatally were seven times more likely to be at-risk seven days postpartum and eight times more at-risk at six weeks post-partum (Collin *et al.* 2006). Amongst women in general, HIV-infected women were more likely to be depressed if they experienced more negative life events or a greater degree of stress, and were unable to fulfil family responsibilities or maintain their usual social life (Olley 2006; Olley *et al.* 2006). Further, negative life events were associated with the recurrence of depression in HIV-infected women, suggesting that significant life stress can result in chronic mental health problems for women living with HIV (Olley *et al.* 2006).

The remaining research has examined the roles of disclosure, loss, sexual violation, stigma and discrimination. Both stigma and discrimination have been associated with poor mental health. Internalised stigma was the best predictor of depression in one study (over and above correlates such as health status, social support and substance use) (Simbayi *et al.* 2007), while another study demonstrated that individuals who were discriminated against or isolated as a result of their positive status were more likely to have a mental disorder (Freeman *et al.* 2007). Further, isolation and discrimination were most likely to predict mental disorder in those with more advanced stages of disease (Freeman *et al.* 2007). Being open about one's status and having a close person die from AIDS (but not other causes) was also associated with having a mental disorder in the same study. With regard to sexual violation, a history of rape or sexual abuse was, perhaps predictably, linked with higher levels of PTSD amongst HIV-infected adults (Olley *et al.* 2005). Other psychiatric conditions were also more common in those with PTSD, including depression, suicidality and social anxiety disorder.

The role of socio-demographic factors

While Adewuya *et al.* (2007) reported that having a psychiatric disorder has no association with gender amongst a group of PLWHA in Nigeria, several other studies have reported an association between gender and specific mental disorders. Research has shown that men are more likely than women to abuse alcohol and other drugs (Sebit *et al.* 2003; Olley *et al.* 2004a; Simbayi *et al.*

2007; Myer *et al.* 2008), while women are more likely to exhibit depression and PTSD (Olley *et al.* 2004b; Olley *et al.* 2005; Kaharuza *et al.* 2006). Reece *et al.* (2007) also demonstrated that paranoid ideation was the most common symptom of distress in HIV-infected women while men were most likely to report somatisation. However, none of the other reviewed studies provide a point of comparison for this finding.

Findings regarding income and employment are also fairly consistent. Depression, PTSD and poor quality of life have all been associated with indicators of financial insecurity, including not having a personal income, financial dependence on others, reduced access to household income, lower household income and the absence of regular household income (Kaharuza *et al.* 2006; Rochat *et al.* 2006; Stangl *et al.* 2007; Myer *et al.* 2008). Only Adewuya *et al.* (2007) failed to find an association between socio-economic status and psychiatric morbidity. With regard to employment, Collin *et al.* (2006) reported that HIV-infected women who were formally employed (rather than informally employed or unemployed) were less likely to experience psychiatric problems one week antenatally. However, there was no association with mental health antenatally or at six weeks post-partum.

Age, marital status and education may also serve to identify groups of individuals at high risk for poor mental health. However, the findings amongst PLWHA in Africa are few in number and inconsistent at times. Depression has been associated with both younger age and older age (Kaharuza *et al.* 2006; Myer *et al.* 2008); generalised anxiety disorder was found to be more common in older people and bipolar mood disorder in younger people (Els *et al.* 1999); but studies with adults and pregnant women failed to find an association with overall psychiatric morbidity (Collin *et al.* 2006; Adewuya *et al.* 2007). An association between level of education and mental disorder has also not been demonstrated (Collin *et al.* 2006; Adewuya *et al.* 2007). Amongst the population of HIV-infected pregnant women, research has reported that married women experience less emotional distress (Bernatsky *et al.* 2007), but also that neither marital status nor having had children previously is associated with antenatal or postpartum morbidity (Collin *et al.* 2006). Further research on these and other potentially important psychosocial factors is required in order to clarify which groups are most at risk for poor mental health as a result of their positive HIV status.

Conclusions and recommendations

The available evidence from PLWHA in Africa indicates high levels of mental health problems. The majority of studies reported that about half of HIV-infected adults had some form of psychiatric disorder, while depression was the most common individual problem. Rates of anxiety tended to be between 20 and 40%, while findings regarding PTSD were more varied. Only one study investigated suicidality, reporting a rate of 9% amongst adults diagnosed not more than six months previously.

PLWHA tended to have more mental health problems than non-infected individuals, with those experiencing lower levels less likely to be poor and more likely to be employed, educated and receiving ART. Evidence also suggested that HIV-infected women may be at greater risk than HIV-infected men for poor mental health, at least where depression is concerned, while rates of alcohol and substance use were higher amongst men. Poor health, receiving poor quality health services and a lack of material and emotional support from family and friends were also reported to be associated with greater psychiatric morbidity.

While these are some of the clearer findings which emerged from the review, the state of the science considerably limits confidence in many of the reported findings. As a result of the range of methodological approaches employed, findings lack comparability and thus the knowledge base remains fairly diverse. While depression appears to be the most common mental health problem amongst PLWHA in Africa, depression is also the most researched problem. Findings regarding the prevalence of depression as well as other common mental health problems need to be replicated in other communities and populations in Africa, especially those with high HIV prevalence. Further, studies should be methodologically sound and would benefit from employing standardised instruments for which data is already available in similar populations in the region. This would greatly enhance the comparability of findings and thus the development of a more consolidated body of evidence which can be used to direct policymaking and program design and implementation. More controlled studies are also needed to confirm that PLWHA are at greater risk for poor mental health than other members of their communities. The majority of individuals living in high HIV prevalence communities in Africa face the stressors of poverty and related issues which themselves challenge the psychological wellbeing of individuals.

Research on predictors of mental health outcomes and on factors associated with adherence to ART which can be targeted in interventions (for example, coping strategies) should also be prioritised. At present, research on psychosocial factors associated with poor mental health in PLWHA in Africa is extremely

limited, with the possible exception of work on support. However, only one study has investigated the potential impact of formal support services. Given that individual counselling and support groups are what most policymakers consider to be a psychosocial service for PLWHA, further research on the benefits of these interventions would be valuable to direct the allocation of scarce human and financial resources. As the availability of ART to people in Africa increases and the face of the epidemic changes, more research on the longer-term mental health needs of PLWHA will also be needed. This will require more studies with patients on treatment, but also longitudinal studies which can assess both changes over time and issues of causality.

Finally, it is well recognised that women constitute nearly 61% of PLWHA in sub-Saharan Africa (UNAIDS 2007). Importantly, the representation of women in study samples was high, with 11 out of 17 studies' samples comprising at least 60% women. However, only a few studies (seven) focused specifically on women's issues and just over a third of studies (eight) with both men and women failed to report some form of gendered analysis. Research from Africa (and elsewhere) suggested that the mental health needs of HIV-infected men and women may differ, either in quantity or quality. Therefore more studies focusing on women's issues and their needs for services are needed. This will contribute to the knowledge base needed to put mental health services for both HIV-infected men and women in Africa on the healthcare agenda.

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