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Research report

Prevalence and correlates of depression among HIV-infected and -affected older people in rural South Africa

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ABSTRACT

Background: Little is known about depression in older people in sub-Saharan Africa, the associated impact of HIV, and the influence on health perceptions.

Objectives: Examine the prevalence and correlates of depression; explore the relationship between depression and health perceptions in HIV-infected and -affected older people.

Methods: In 2010, 422 HIV-infected and -affected participants aged 50+ were recruited into a cross-sectional study. Nurse professionals interviewed participants and a diagnosis of depressive episode was derived from the Composite International Diagnostic Interview (Depression module) using the International Classification of Diseases diagnostic criteria and categorised as major (MDE) or brief (BDE).

Results: Overall, 42.4% ($n=179$) had a depressive episode (MDE: 22.7%, $n=96$; BDE: 19.7%, $n=83$). Prevalence of MDE was significantly higher in HIV-affected (30.1%, 95% CI 24.0–36.2%) than HIV-infected (14.8%, 95% CI 9.9–19.7%) participants; BDE was higher in HIV-infected (24.6%, 95% CI 18.7–30.6%) than in HIV-affected (15.1%, 95% CI 10.3–19.8%) participants. Being female (aOR 3.04, 95% CI 1.73–5.36), receiving a government grant (aOR 0.34, 95% CI 0.15–0.75), urban residency (aOR 1.86, 95% CI 1.16–2.96) and adult care-giving (aOR 2.37, 95% CI 1.37–4.12) were significantly associated with any depressive episode. Participants with a depressive episode were 2–3 times more likely to report poor health perceptions.

Limitations: Study limitations include the cross-sectional design, limited sample size and possible selection biases.

Conclusions: Prevalence of depressive episodes was high. Major depressive episodes were higher in HIV-affected than HIV-infected participants. Psycho-social support similar to that of HIV treatment programmes around HIV-affected older people may be useful in reducing their vulnerability to depression.

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1. Background

Depression is a leading cause of disease burden globally (Collins et al., 2011; Patel et al., 2011; Mathers and Loncar, 2006), and with the growing proportions of older people, the overall numbers of

people with depressive symptoms are expected to rise. Projections suggest that by 2030 unipolar depressive disorders will contribute 6.2% to the global burden of disease in terms of disability-adjusted life years, roughly equal to the contribution of heart disease (WHO, 2008). Estimates of depression in older people vary widely across regions and populations. Early estimates from a systematic review of community-based studies of older people put the weighted average of major depression at about 2% (Beekman et al., 1999). More recently, substantially higher estimates have been reported from various settings: between 8% and 20% (Barry et al., 2008; Beekman et al., 2001; Blazer, 2003); in a European study, estimated prevalence ranged from 18% in Denmark to 37% in Spain. (Castro-Costa et al., 2007) and a review of studies in Africa, South America and Asia reported estimates from 11% to 53% (Akena et al., 2012). However, a recent study from South Africa reported a low prevalence of depression in older people of 4% (Peltzer and Phaswana-Mafuya, 2013).

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Overall, the prevalence of depression in older people in sub-Saharan Africa remains poorly quantified, partly because it is rarely diagnosed in the public health care systems, partly because older people are seldom research subjects, and lastly because differences in diagnostic methodology hinder the interpretation of differences in prevalence estimates (Robins and Cottler, 2004).

While frequently under-diagnosed, depression in older people is fairly commonplace and debilitating (Lapid and Rummans, 2003; Reynolds et al., 2008); is associated with increased disability (Castro-Costa et al., 2007; Arnow et al., 2006); increased burden on public health service utilization (García-Peña et al., 2008; Lapid and Rummans, 2003; Rowan et al., 2002) and increased risk of mortality (Snowden et al., 2008; Antelman et al., 2007). Older people are also at risk of other chronic morbidities such as hypertension, arthritis, heart disease and diabetes (Mayosi et al., 2009b; Christensen et al., 2009; He et al., 2012); the management and outcomes of which may be impacted by undiagnosed depression (Demyttenaere et al., 2004). When depression occurs in the context of these chronic diseases it is known to complicate help-seeking, diagnosis (Cuijpers et al., 2004; Pilling et al., 2009) and can adversely impact health status (Moussavi et al., 2007) and adherence to medical treatments (Kagee, 2010; Andrews, 2001).

Sub-Saharan Africa faces a triple burden of HIV, TB and chronic disease epidemics. In South Africa, communicable and non-communicable disease burden is high (Coovadia et al., 2009; Karim et al., 2009; Mayosi et al., 2009a) as is the burden of depression (Tomlinson et al., 2009). Psychological distress has been associated with HIV as well as hypertension and diabetes (Kagee, 2010). However, the relationship between depression and HIV is complex (Gupta et al., 2010). Some studies report a HIV diagnosis to be associated with becoming depressed (Hand et al., 2006; Boarts et al., 2009), while others report that depression is associated with rapid HIV disease progression (Ickovics et al., 2001) either directly, or through inconsistent use or poor adherence to antiretroviral treatment (Carrico et al., 2011; Gonzalez et al., 2011). There is even evidence of an increased risk of onset of HIV-related dementia among depression patients (Farinpour et al., 2003), but less information on the impact of antiretroviral treatment (ART) on this relationship.

In Southern Africa older people have been shown to have a higher burden of HIV than previously expected (Wallrauch et al., 2010a; Mutevedzi and Newell, 2011; Negin and Cumming, 2010), and are frequently caregivers of children and young adults (Richter and Desmond, 2008). Little is however known of the prevalence and correlates of depression in older people by HIV status or how this may impact on their health perceptions. The aim of this analysis was to examine the prevalence and correlates of depression in HIV-infected and HIV-affected older people living in a rural area of South Africa heavily affected by HIV. We also explored the relationship between depression and self-reported health.

2. Methods

2.1. Research context

The Wellcome Trust-funded Africa Centre for Health and Population Studies (www.africacentre.com) is based in rural northern KwaZulu-Natal, South Africa and is heavily affected by HIV (Tanser et al., 2008). The Africa Centre carries out socio-demographic and HIV surveillance in a geographically defined area in the south of the Hlabisa sub-district. The population in the Demographic Surveillance Area (DSA) covers about 40% of that of the sub-district. Approximately 11,000 households, with approximately 90,000 resident and non-residents members, are visited twice a year since 2000. Nested within the household surveillance cohort is the population-based HIV cohort which started in 2003. Between 2003 and 2006, all

women aged 15–49 years and men aged 15–54 years resident in the surveillance area were eligible for HIV testing. From 2007, eligibility was extended to all residents aged 50 years and above. In addition, there is extensive Geographic Information System (GIS) location information of all structures in the Surveillance, including homes, clinics, and roads (Tanser et al., 2008; Tanser et al., 2001).

2.2. The health and well-being of older people study (WOPS)

Data used for this analysis was collected as part of a cross-sectional study called the 'Health and Well-being of Older People Study (WOPS)'. In this World Health Organisation (WHO) supported study inclusion criteria required participants to be: aged 50 years or above; members of the Africa Centre for Health and Population Studies Demographic Surveillance System (ACDIS) (Tanser et al., 2008); and resident in the surveillance area during the study period (March–August 2010). WOPS and some of the main findings regarding the health status of older people are described in detail elsewhere (Nyirenda et al., 2012). The WOPS study was endorsed by the Africa Centre community advisory board (CAB) on behalf of the study community. All participants in the study provided written informed consent. The University of KwaZulu-Natal Biomedical Research Ethics Committee provided ethical approval of the study (Ref. no. BF136/09).

2.3. Sampling strategy

Given that HIV infection, HIV treatment and/or HIV burden in the household may affect depression status, the sample was selected using stratified random sampling of older people aged 50 years and above in four groups of

1. older persons who were HIV-infected and on ART for a year or longer;
2. older persons who were HIV-infected but not yet on ART or on ART for up to 3 months;
3. older persons living with an adult HIV-infected offspring (18–49 years) who is on ART; and
4. older persons with an adult child who died of HIV-related causes.

Participants could belong to only one of the four groups. For the few individuals who were HIV-infected but also had an HIV-infected adult or HIV-related death of an adult offspring, their own HIV status was prioritised and assigned to either group 1 or 2, as applicable. The sampling frame identified 241, 117, 662 and 142 participants eligible for groups 1 to 4 respectively, from which 100 participants were randomly selected for each group. Participants in groups 1 and 2 were later categorised as 'HIV-infected', while those in groups 3 and 4 were categorised as 'HIV-affected'. All sampled individuals were visited at their homesteads and if other older people 50+ who met the eligibility criteria were found at the homesteads they were similarly invited to participate in the study; the final sample consisted of 422 older people aged 50+.

2.4. Depression assessment

A shortened version of the WHO Study on Global Ageing (SAGE) instrument (WHO, 2011) was used, including a set of questions on depressive symptoms adapted from the Composite International Diagnostic Interview (CIDI 3.0) depression module (Kessler and Ustun, 2004) translated into the local language, IsiZulu, using a standard WHO translation protocol involving translation, back-translation and review by bilingual experts. The study questionnaires were administered in face-to-face interviews by two IsiZulu-speaking professional nurses.

In determining depression status, two sources of information were used. Initially all study participants were asked to report whether they had ever been diagnosed or told by a health professional that they had depression; we expected only a very small number of study participants to ever have been formally diagnosed with depression (Lapid and Rummans, 2003). Second, participants were asked a set of questions based on CIDI 3.0 to assess the likelihood of them having had a depressive episode within the 12 months prior to the interview. These symptomatology questions can be categorised into two criteria sets based on the International Classification of Diseases 10th edition, Diagnostic Criteria for Research for depressive episode (ICD 10-DCR) (WHO, 1993). Criteria A symptoms ask about feeling sad or empty (depressed mood), loss of interest in things one usually enjoys doing (loss of interest) and feeling decreased energy or tired all the time (fatigue). Participants experiencing one or more of the Criteria A symptoms in the previous 12 months were then asked to respond to questions on the Criteria B symptoms, which include loss of appetite, worry and anxiety, sleep deprivation, suicide ideation, psychomotor restlessness, loss of confidence, concentration difficulties, hopelessness and loss of interest in sex.

Presence of a depressive episode in the past year was determined based on the ICD 10-DCR. Persistence of symptoms and duration, required by the ICD 10-DCR, were determined by questions about whether the period of depressed mood, loss of interest or fatigue lasted for 'most of the day, nearly every day' for 2 weeks or more. We categorised episodes as major depressive episode (MDE) if the symptom criteria were met, were persistent (most of the day, nearly every day) and had lasted for 2 weeks or more. Symptoms of less than two weeks duration were categorized as a brief depressive episode (BDE).

Literature suggests that recent bereavement is associated with increased presentation of depressive symptoms (Yunming et al., 2012; Fiske et al., 2003) and thus may lead to over-estimation of depression. Although the prevalence of a MDE or any depressive episode (MDE and BDE combined) was highest in participants who had experienced a recent HIV-related death of an adult offspring, excluding this group did not significantly change our findings or their interpretations. We thus did not exclude this group from the final results presented here.

2.5. Data analysis

During data analysis, because previous research has shown that the health and well-being of older people is affected by socio-demographic, economic and household living-arrangement factors (Nyirenda et al., 2012; Scholten et al., 2011), we controlled for these factors when examining correlates of depression in HIV-infected and HIV-affected older people. Specifically, these factors included: age (50–59, 60–69, 70–79 and 80+ years); sex (male or female); marital status (never married, currently married,

previously married); source of income (none, government grants, other); educational attainment (no formal education, primary, secondary); place of residence (rural or urban); household socio-economic status using an index based on asset ownership (McKenzie, 2005) and care-giving.

Chi square statistics were used to explore socio-demographic characteristics of participants by depression status; multivariable logistic regressions were used to determine the associations between the socio-demographic factors and depression. We further examined in logistic regressions the relationship of depression with a composite health status score that combines multiple items covering functioning in a range of domains broken down by tertiles that we labelled good, moderate or poor, as detailed previously (Nyirenda et al., 2012; Nyirenda et al., 2013). All statistics were 2-tailed and a p-value < 0.05 was used to determine statistical significance. All data were analysed using Stata 11.

3. Results

Of the 422 older people included in the study, only a very small proportion, 3% ($n=12$), reported that they had ever been diagnosed or told by a health professional that they had depression; 3 of the 12 reported taking medication for depression in the two weeks prior to the interview. About one third of participants (36%, $n=152$) did not report any criteria A symptoms; 15% ($n=63$) had one; 24% ($n=100$) two and 25% ($n=107$) three Criterion A symptoms. With regard to Criterion B symptoms, 64% ($n=269$) reported at least one of these symptoms. Excluding the 36% ($n=153$) without Criterion B symptoms, the median number of Criterion B symptoms reported was 4 (IQR 2); the four most commonly reported symptoms were sleep deprivation, psychomotor restlessness, worry and anxiety, and loss of confidence.

Table 1 presents the prevalence of depressive episodes, based on reported symptoms, disaggregated into the four groups, and for the overall sample. Overall, 42.4% ($n=179$) had a depressive episode in the preceding 12 months; 22.7% ($n=96$) had MDE and 19.7% ($n=83$) had BDE. The prevalence of any depressive episode was highest in older people who had experienced an HIV-related death of an adult offspring in the two years prior to interview, followed by older people who were HIV-infected but not yet on ART or on ART for less than 3 months; and the prevalence was lowest in older people with an HIV-infected adult offspring on treatment (Table 1). Our findings further show that the prevalence of MDE was higher in older people with adult offspring who had died of HIV-related cause and in older people with an HIV-infected adult offspring; whereas BDE was highest among HIV-infected older people on ART for a year or longer. This became clearer when the four groups were combined into two groups of HIV-infected and HIV-affected older people. The

Table 1
Prevalence levels of depressive episodes in HIV-infected or HIV-affected older people, rural South Africa.

	Major depressive episode % (95% CI)	Brief depressive episode % (95% CI)	Any depressive episode % (95% CI)
Older people on HIV treatment for 1 year or longer	14.0 (7.1–20.9)	25.0 (16.4–33.6)	39.0 (29.4–48.6)
Older people not yet on ART or on ART for 3 months or less	15.5 (8.5–22.6)	24.3 (15.9–32.6)	39.8 (30.3–49.3)
Older people with an HIV-infected adult offspring	21.5 (13.7–29.3)	15.0 (8.1–21.8)	36.4 (27.3–45.6)
Older people who had experienced an HIV-related adult death	38.4 (29.3–47.5)	15.2 (8.5–21.9)	53.6 (44.3–62.9)
Overall	22.7 (18.7–26.8)	19.7 (15.9–23.5)	42.4 (37.7–47.2)
<i>n</i>	96	83	179

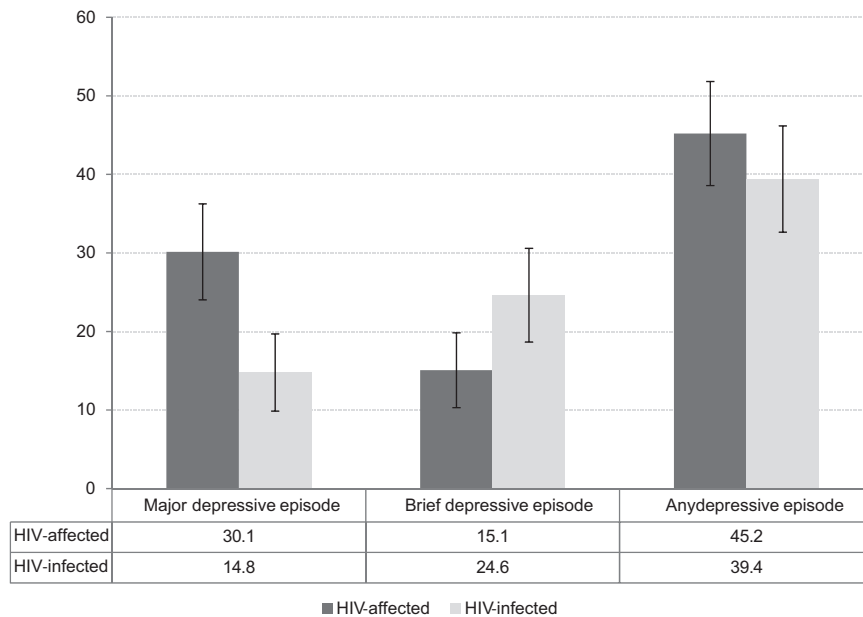


Fig. 1. Prevalence of depression in HIV-infected and HIV-affected older people, rural South Africa.

prevalence of MDE was significantly higher in HIV-affected (30.1%, 95% CI 24.0–36.2%) than HIV-infected (14.8%, 95% CI 9.9–19.7%) participants; while the prevalence of BDE was higher in HIV-infected (24.6%, 95% CI 18.7–30.6%) than in HIV-affected (15.1%, 95% CI 10.3–19.8%) older people (Fig. 1).

In multivariable analyses including sex, age, marital status, education, source of income, place of residence, household wealth quintile and caregiving, women were 3 times more likely than men to have had a depressive episode (aOR 3.0, 95% CI 1.7–5.4); and primary or higher level of education was associated with decreased likelihood of a depressive episode, but this was only statistically significant in unadjusted analyses (Table 2). Participants receiving a government grant had a 64% adjusted reduced odds of having had a depressive episode compared to those without any source of income (aOR 0.34, 95% CI 0.15–0.75). Lastly, care-giving to adults (18–49 years) or children (under 18 years) was associated with an increased risk of having experienced a depressive episode, although after adjustment only care-giving to adult offspring remained significantly associated (aOR 2.37, 95% CI 1.37–4.12).

Table 3 presents the relationship between a depressive episode and self-reported health status. Relative to self-reporting good health, older people who reported symptoms of a depressive episode in the past 12 months were more likely to self-report their health status as poor after adjustment for age and sex, which are independently associated with poor self-reported health. Among participants who had experienced a MDE in the past one year, the odds of reporting poor or moderate health status compared to good health status were statistically significantly higher for older people who were HIV-infected and not yet on ART or on ART for 3 months or less as well as for older people with an HIV-infected adult offspring. There were no significant associations between having had a MDE and self-reported health in older people who were HIV-infected and on ART for a year or longer, or in older people who had experienced an HIV-related death of an adult offspring. Similarly, no significant associations were found for any of the study groups between having had a BDE and self-reported health. Overall, older people with a major depressive episode had about three-fold increased adjusted odds of poor self-reported (aOR 2.68, 95% CI 1.34–5.38); and approximately double the adjusted odds of moderate or poor self-reported health status if they had any depressive episode.

Table 2

Factors associated with having a depressive episode in older people, rural South Africa.

Factors	OR [95% CI]	aOR [95% CI]
Sex		
Male	1.00	1.00
Female	2.89 [1.76–4.74]	3.04 [1.73–5.36]
Age group		
50–59	1.00	1.00
60–69	0.82 [0.52–1.31]	0.78 [0.44–1.37]
70–79	1.64 [0.95–2.81]	1.60 [0.80–3.19]
80+	1.92 [0.88–4.18]	1.90 [0.74–4.87]
Marital status		
Never married	1.00	1.00
Married	0.48 [0.30–0.77]	0.58 [0.34–0.99]
Previously married	2.04 [1.18–3.53]	1.24 [0.64–2.41]
Education level		
None	1.00	1.00
Primary	0.52 [0.34–0.80]	0.77 [0.47–1.26]
Secondary or higher	0.52 [0.28–0.97]	0.96 [0.45–2.07]
Source of income		
None	1.00	1.00
Government grants	0.44 [0.22–0.86]	0.34 [0.15–0.75]
Other	0.23 [0.10–0.57]	0.20 [0.07–0.54]
Place of residency		
Rural	1.00	1.00
Urban	1.73 [1.17–2.56]	1.86 [1.16–2.96]
Household socio-economic status in quintiles		
First	1.00	1.00
Second	0.78 [0.43–1.44]	0.98 [0.49–1.98]
Third	0.85 [0.47–1.53]	0.88 [0.44–1.73]
Fourth	0.64 [0.35–1.15]	0.69 [0.35–1.39]
Fifth	0.54 [0.29–1.00]	0.71 [0.33–1.51]
Care-giving to adults (18–49 years)		
No	1.00	1.00
Yes	2.96 [1.98–4.42]	2.37 [1.37–4.12]
Care-giving to children (under 18 years)		
No	1.00	1.00
Yes	1.95 [1.31–2.91]	0.96 [0.57–1.63]

Note: OR=Odds ratio; AOR=Adjusted Odds ratio, adjusted for age, sex, marital status, education, source of income, place of residency, household socio-economic status and care-giving.

Table 3

Age-sex adjusted odds of the association of depressive episodes with self-reported health status in HIV-infected or HIV-affected older people, rural South Africa.

Self-reported health status as	Major depressive episode aOR [95% CI]	Brief depressive episode aOR [95% CI]	Any Depressive episode aOR [95% CI]
Older people on HIV treatment for 1 year or longer			
Good	1.00	1.00	1.00
Moderate	1.42 [0.38–5.26]	1.69 [0.59–4.86]	1.86 [0.71–4.90]
Poor	1.74 [0.28–10.93]	0.76 [0.13–4.43]	1.13 [0.26–4.99]
Older people not yet on ART or on ART for 3 months or less			
Good	1.00	1.00	1.00
Moderate	9.58 [1.11–82.63]	0.65 [0.22–1.94]	1.65 [0.61–4.46]
Poor	12.81 [1.38–118.58]	1.41 [0.39–5.13]	3.95 [1.18–13.23]
Older people with an HIV-infected adult offspring			
Good	1.00	1.00	1.00
Moderate	4.96 [1.45–16.95]	1.31 [0.42–4.07]	3.38 [1.35–8.47]
Poor	11.96 [2.30–62.21]	–	2.97 [0.71–12.49]
Older people who had experienced an HIV-related adult death			
Good	1.00	1.00	1.00
Moderate	1.66 [0.65–4.20]	1.53 [0.43–5.49]	1.93 [0.80–4.62]
Poor	0.86 [0.26–2.82]	3.71 [0.84–16.41]	1.76 [0.57–5.43]
Overall			
Good	1.00	1.00	1.00
Moderate	2.43 [1.40–4.23]	1.14 [0.66–1.96]	1.98 [1.27–3.09]
Poor	2.68 [1.34–5.38]	1.28 [0.61–2.67]	2.36 [1.28–4.33]

4. Discussion

4.1. Prevalence of depression in older people

This study is one of the first assessments of depression among older people in a rural population in Southern Africa, a setting heavily affected by HIV, TB and chronic illness (Houlihan et al., 2010; Wallrauch et al., 2010b). Based on the ICD10-DCR, we found that nearly half of all study participants had experienced a depressive episode in the 12 months prior to the survey, and just over one in five had experienced a major depressive episode in the same time period. The prevalence of depression in this study was similarly high to that reported in other studies (Castro-Costa et al., 2007; Akena et al., 2012), but higher than reported by Peltzer and Phaswana-Mafuya (2013). The elevated levels of depression in our sample, when major and minor depressive episodes are combined, could be due to the nature of the population: our study participants live in a setting severely affected by HIV and all participants were either HIV-infected themselves or HIV-affected. As Bor et al. (2012) showed, in 2010 around 40% of people in the study area lived in a household with at least one person who had accessed the HIV treatment programme. Research with another high risk population of pregnant women in this community also reported high depression prevalence (47%) using interviewers trained in the structured clinical interview for DSM-IV (Rochat et al., 2011). Although the estimated prevalence of depression, on the basis of reported symptoms, in our study was high, only a very small proportion of the study participants reported ever having been diagnosed with depression by a health worker and a few of those were on treatment. This is not surprising since depression screening in primary health care system in South Africa, as in many low and middle income countries (LMIC), is not routine, even among older people at high risk of depression (Luijendijk et al., 2008; Gupta et al., 2010).

Given that depression is rarely diagnosed but can have serious debilitating effects on older people (Reynolds et al., 2008), it is vital to combine major and brief depressive episodes to get a fuller

picture of the scale of the problem. As noted by Lee et al. (2012) emphasising only major depression would leave many, in our case one in five, undiagnosed, untreated and at increased risk of multiple morbidities (Castro-Costa et al., 2007; Lapid and Rummans, 2003) and mortality (Snowden et al., 2008; Antelman et al., 2007). Some evidence suggests that mild to moderate depression can have as significant an impact on health functioning as severe depression, in particular in low income groups (Lee et al., 2012; Meeks et al., 2011; Ayuso-Mateos et al., 2010).

4.2. Predictors of depression in older people

Variables significantly associated with increased chances of having a depressive episode included being female, having no source of regular income, living in an urban area and being a caregiver, in particular to an adult offspring. We also show that older people who had experienced a depressive episode in the preceding 12 months were 2 to 3 times more likely to report their health status as moderate or poor. However, the results for specific groups of older people such as the group of participants who were not yet on ART, or on ART for less than 3 months, and older people with an HIV-infected adult offspring should be interpreted with caution given the wide confidence intervals and small sample sizes.

Our results suggests that the well-documented poor health status of older women relative to men (Yount and Agree, 2005; Arber and Cooper, 1999) is not restricted to reporting of disability but is pervasive to mental health as well (Rieker and Bird, 2005). It is equally plausible that depression may influence the health reporting of these women, since depression is known to influence thoughts and perceptions negatively and to reduce problem solving (Patel et al., 2009). It has long been known that women are particularly vulnerable to both depression and HIV, and it seems likely, given that women carry a disproportioned burden of caregiving in most low and middle income settings, that the effects of depression extend to impact on the family and the quality of care, rather than being limited to the individual. In earlier analyses

(Nyirenda et al., 2013) we found that 2 in 3 of the older people were care-givers to at least one adult offspring or child; and as seen in other studies, a higher proportion of older people are main care-givers to HIV-infected adults and to children they leave behind orphaned (Hill et al., 2008; Ssengonzi, 2007; Schatz, 2007). Here we show a strong association between care-giving, especially to adults, and having a depressive episode. This may partly contribute to our other major finding that the prevalence of having had a major depressive episode was significantly higher in HIV-affected (30.1%, 95% CI 24.0–36.2%) than HIV-infected (14.8%, 95% CI 9.9–19.7%) older people. The Hlabisa HIV treatment and care programme, as in the rest of South Africa, is mostly nurse and counsellor led and follows the South African Department of Health (DoH) guidelines (Houlihan et al., 2011). Older people who are HIV-infected usually receive psycho-social counseling before, during and after HIV testing. HIV-infected people are further encouraged to have a 'support-buddy' to help them with managing their HIV status. A qualitative study of 30 HIV-infected older women aged 60 years and older demonstrated how a psycho-socio-environmental support model was useful in helping older people come to terms with their physical, mental and social well-being in the context of HIV (Schatz and Gilbert, 2012). Such a support structure around an older person who is HIV-uninfected but giving care to an HIV-infected adult or who has to deal with an HIV-related death in the household may not be readily available, which may explain the higher levels of depressive episodes we find among HIV-affected older people.

Our findings adjusting for age and other socio-demographic factors show that older adults accessing government grants were nearly two-thirds less likely to have had a depressive episode in the preceding 12 months than those without a source of income. These findings are consistent with previous findings from South Africa which show that older adults who were in receipt of government old-age pension grants had decreased risk of having common mental disorders (CMD) (Plageron et al., 2010) and presents a supportive case for the government to consider a universal old-age grant for all older persons, unlike the present case where it is means-tested. The government should also consider some welfare support to older persons aged 50–59 years without an income but not yet age-eligible for the old-age pension grant. In rural areas such as in our study area there is wide spread deprivation with around 82% of households living in poverty (Fiorenza et al., 2009) as such nearly all older people in the area are vulnerable and in need to welfare support. Even though the relationship between income support and mental health is complex and poorly understood in LMIC settings (Lund et al., 2010; Lund et al., 2011), the known benefits of a pension grant for the entire household (Booyesen, 2004; Case and Menendez, 2007) and our finding of grant recipients being associated with lower odds of having a depressive episode may well justify this policy recommendation of a universal old-age grant. Furthermore, the important role played by older caregivers in Africa should not be underestimated, for example in South Africa, the presence of an older aged adult in receipt of a pension grant can significantly increase the odds of improved growth and education outcomes for children (Richter and Desmond, 2008; Case and Menendez, 2007). As such depression amongst older caregivers may significantly impact on the well-being of households more generally.

4.3. Depression and health perceptions

Depression may adversely influence the health status of older adults, and adversely impact health seeking behavior (Barney et al., 2006). We found that persons with a depressive episode were more likely to self-report their health as poor. This appears to support previous findings which show co-morbidities between chronic conditions (e.g. angina, diabetes, arthritis and asthma) and

depression are common (Moussavi et al., 2007). Our results are thus in line with other studies showing depressed people are highly likely to consume more health care services than non-depressed people (Rowan et al., 2002; Lapid and Rummans, 2003; García-Peña et al., 2008). The increased likelihood that self-reported health was moderate or poor in older people with a depressive episode may partially explain this increased health service utilization. If depression screening is not routinely carried out but these symptoms are assumed to be normal symptoms of ageing instead (Lapid and Rummans, 2003), depression is likely to go undiagnosed and untreated (Reynolds et al., 2008). Depressed older people are then also highly likely to return repeatedly to health facilities (Luber et al., 2001) becoming a serious burden on already resource-constrained health facilities.

5. Conclusions

Our findings suggest very high levels of either inadequate recognition or inadequate treatment of depression among older people in rural South Africa, with higher prevalence of major depressive episode in HIV-affected than in HIV-infected older people. Women, those with no source of income and care-givers were particularly vulnerable to reporting symptoms suggestive of depression. These vulnerable groups should be targeted for any intervention in the form of psycho-social and financial support. In populations with a severe HIV burden, psycho-social support should also be available to HIV-uninfected older people to reduce their risk of having a depressive episode, especially as they often face the burden of caring for HIV-infected adults and orphans. This study sheds some light on the prevalence and correlates of depression in HIV-infected or HIV-affected older people in rural Africa, but further research is needed to inform understanding of the nuanced nature in which depression relates to HIV status of older people particularly using longitudinal population-based data sources.

5.1. Limitations

Data for this analysis came from a cross-sectional study, and causality cannot be inferred. Further, the levels of depression reported are based on self-reports of depression symptoms rather than a formal clinical diagnosis, and participants could have over- or under-reported their symptoms. We are unable to test the extent to which this misreporting could have influenced our results, but our findings are likely to be valid since they are consistent with results by others in similar study settings (Rochat et al., 2011; Akena et al., 2012; Olley et al., 2004). Recall bias in the reporting of depressive symptoms or diagnosis due to social stigma associated with depression could also have played a role, as could memory lapse due to cognitive functioning decline with age, but again the similarity of our estimated prevalence of depression compared to that in other studies is re-assuring.

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Conflict of interest

All authors declare no conflict of interests.

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