



## An exploratory analysis of factors associated with depression in a vulnerable group of young people living in informal settlements in South Africa

Andrew Gibbs, Kaymarlin Govender & Rachel Jewkes

To cite this article: Andrew Gibbs, Kaymarlin Govender & Rachel Jewkes (2018) An exploratory analysis of factors associated with depression in a vulnerable group of young people living in informal settlements in South Africa, *Global Public Health*, 13:7, 788-803, DOI: [10.1080/17441692.2016.1214281](https://doi.org/10.1080/17441692.2016.1214281)

To link to this article: <https://doi.org/10.1080/17441692.2016.1214281>



Published online: 17 Aug 2016.



Submit your article to this journal [↗](#)



Article views: 402



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 15 View citing articles [↗](#)



# An exploratory analysis of factors associated with depression in a vulnerable group of young people living in informal settlements in South Africa

Andrew Gibbs<sup>a</sup> , Kaymarlin Govender<sup>a</sup> and Rachel Jewkes<sup>b,c</sup>

<sup>a</sup>Health Economics HIV/AIDS Research Division (HEARD), University of KwaZulu-Natal, Durban, South Africa;

<sup>b</sup>Gender and Health Research Unit, South African Medical Research Council, Pretoria, South Africa; <sup>c</sup>School of Public Health, University of the Witwatersrand, Johannesburg, South Africa

## ABSTRACT

Depression amongst young people is a major health challenge and is often shaped by social marginalisation. Informal settlements are growing rapidly. There is a need to deepen understandings of depression amongst young people in these contexts. We sought to understand factors associated with depressive symptomatology amongst 232 young people (122 women, 110 men) aged 18–30 in urban informal settlements in South Africa. We conducted a cross-sectional analysis of baseline data collected for the Stepping Stones and Creating Futures pilot. Logistic regression modelled relationships between depressive symptomatology, livelihoods and violence. Symptomatic depression in this population was 49.5% for men and 57.9% for women. In multiple regression, depression in men was associated with stealing because of hunger (adjusted Odds Ratio (aOR) 5.78,  $p = .03$ ), being more controlling in relationships (aOR 0.81,  $p = .008$ ) and being more ashamed about lack of work (aOR 0.75,  $p = .01$ ). For women, depressive symptoms were associated with greater stress about lack of work (aOR 0.72,  $p < .0001$ ) and food insecurity (aOR 5.57,  $p = .039$ ). The study emphasises that socio-economic factors, shaped by local understandings of gender, play a significant role in depressive symptomatology. We suggest reducing economic distress may have an important role in reducing depression in this population.

## ARTICLE HISTORY

Received 22 January 2016

Accepted 13 July 2016

## KEYWORDS

Depression; informal settlements; youth; livelihoods; gender

## Introduction

Depressive symptoms are a major health challenge, particularly for young people. Global estimates for older adolescents (15–19) suggest unipolar depressive disorders are the leading cause of Disability Adjusted Life Years (DALYs) lost, while for 20–24 year olds, it remains the first cause for DALYs lost for women and third for men (Gore et al., 2011). The gendered nature of depressive symptomatology is seen in global studies estimating that young women experience depression at a factor of 2:1 compared to young men (Gore et al., 2011; Thapar, Collishaw, Pine, & Thapar, 2012). In South Africa, there is a significant burden of depressive disorders. One nationally representative survey estimated 20.9% of men and 26.4% of women had significant depressive symptomatology (Ardington

& Case, 2010). While another estimated the incidence of past year major depressive disorder to be 4.9% (Tomlinson, Grimsrud, Stein, Williams, & Myer, 2009).

As well as a major health challenge in its own right (Gore et al., 2011), depressive symptomology has been linked to other poor health outcomes and HIV-risk behaviours. A substantial body of research, particularly in the global north, has used the concept of syndemics to emphasise how mental health challenges create HIV-vulnerability for people (Tsai & Burns, 2015). In South Africa, depressive symptoms were associated with experiences of forced sex and transactional sex (Smit et al., 2006). While a longitudinal study in South Africa showed depressive symptomology was linked to limited condom use amongst men and transactional sex and for women experiencing two or more episodes of intimate partner violence (IPV) (Nduna, Jewkes, Dunkle, Shai, & Colman, 2010). More widely, it has been suggested that depressive symptomology is a potential 'marker' of HIV-vulnerability (Lennon, Huedo-Medina, Gerwien, & Johnson, 2012; Nduna et al., 2010).

A range of behavioural and social factors have been linked to depressive symptomology. Globally low socio-economic status is directly linked to depression (Kuo, Operario, & Cluver, 2012; Lorant et al., 2003), including amongst adolescent populations (Reiss, 2013). The exact relationship varies, with stronger evidence for markers of poverty such as food insecurity, education, social class and financial stress showing strong positive associations with depressive symptoms, whereas income, earnings and consumption showing a mixed relationship to depressive symptoms (Lund et al., 2010). Studies also highlight that depression may be linked to limited employment opportunities for young people out of school (Patel, Flisher, Hetrick, & McGorry, 2007). In South Africa, a legacy of apartheid and the high levels of poverty amongst black South Africans has contributed to poor mental health outcomes (Dawes, 1985; Petersen, Swartz, Bhana, & Flisher, 2010; Plagerson, Patel, Harpham, Kielmann, & Mathee, 2011).

Violence is recognised as a factor for depression. For women, experiencing IPV is linked to depression – although the relationship is likely bi-directional (Devries et al., 2013). For men, studies suggest an association between depression and perpetration of IPV (Fulu, Jewkes, Roselli, Garcia-Moreno, & UN Multi-Country Cross Sectional Study on Men and Violence, 2013; Nduna et al., 2010), however it maybe that men's depressive symptomology is linked to their wider social and economic marginalisation that in turn shapes a clustering of behaviours and attitudes focused on patriarchal control of women rather than their perpetration of IPV per se (Jewkes & Morrell, 2010).

More widely the social, political and economic marginalisation of young people maybe an underlying factor in their experience of depressive symptomology (Emslie, Ridge, Ziebland, & Hunt, 2006; Nduna & Jewkes, 2012). This plays out differently for women and men. For women, gender inequalities, particularly lack of power in relationships and violence, alongside their lack of economic autonomy are key factors in their wider disempowerment and silencing, which is associated with in depressive symptomology (Devries et al., 2013; Hatcher et al., 2012). While in men some studies suggest men's adherence to rigid norms of 'traditional' masculinity (broadly being self-sufficient, invulnerable and a provider) and the failure to achieve these aspirations are a key determinant of depressive symptomology (Coleman, 2015).

Urban informal settlements are burgeoning rapidly globally including in South Africa (WHO & UN-Habitat, 2010). These provide spaces for a growing youth population, with

easy access to work and other opportunities of cities. However, they are also sites of high rates of poverty, violence and HIV-vulnerabilities, all potentially contributing to poor mental health outcomes (Gibbs, Sikweyiya, & Jewkes, 2014; Kuo et al., 2012; Smit et al., 2006; WHO & UN-Habitat, 2010). Studies globally and in South Africa suggest that urban informal settlements may have higher rates of depression than other settlement types, potentially linked to 'social disorganisation' or lack of community cohesion (Ardington & Case, 2010; Mair, Roux, & Galea, 2008; Tomita, Labys, & Burns, 2014). Yet little is known about what factors shape depressive symptoms at the individual level in urban informal settlements. The aim of this paper is to understand the association between depressive symptomology and social factors shaping young people's lives, in populations living in urban informal settlements in South Africa.

## Methods

### *Study site and population*

Cross-sectional data interviews were conducted in April and May 2012 with 232 young women and men from the baseline phase of a pilot feasibility trial to evaluate Stepping Stones and Creating Futures intervention on IPV, HIV-risk behaviours and livelihoods (Jewkes et al., 2014). Participants came from two urban informal settlements in Durban, South Africa, characterised by lack of access to formal services, dense living conditions, high levels of poverty, crime and violence and high HIV-incidence and prevalence. Participants were recruited via snowball sampling based initially on team connections with people living in the area. Interviews were conducted at a nearby site in central Durban as the informal settlements lacked spaces to conduct research. Each participant received R50 (approx. US\$5) for completion of the questionnaire and additional travel related costs.

### *Ethics statement*

Ethical permission was secured from the University of KwaZulu-Natal's Human and Social Science Research Committee, and the South African Medical Research Council's ethics committee. Inclusion criteria included being over 18, able to consent to participation in the study and being from the urban informal settlements. There was no inclusion/exclusion criteria related to HIV-status. All participants completed informed consents prior to undertaking questionnaires.

### *Measurement tools*

Data were collected using paper and pencil based self-completed structured questionnaires in English or isiZulu. Participants completed these individually, with trained research assistants available to respond individually to participant queries when required. The questionnaire included socio-demographic factors, livelihoods, depressive symptomology, violence and gender attitudes. Administration time was about forty-five minutes.

### Depressive symptomology

Our primary outcome was the Centre for Epidemiological Studies on Depression (CES-D) scale, measuring symptomology of depression. CES-D has been validated (Radloff, 1977) and has been culturally adapted and widely used in South Africa (Nduna et al., 2010; Pretorius, 1991; Tomita et al., 2014). The CES-D has 20 items, which ask about past week symptoms associated with depression. Responses were on a four-point Likert scale ranging from 0 (*rarely or none of the time*) through to 3 (*almost or all of the time*). The main analysis used a cut of 15/16; scores of 16 or larger categorised participants as showing moderate to high symptoms of depression, while scores of 15 or less were classified as having low or no symptoms. This cut-point has been widely used to assess depression (Radloff, 1977). To provide an estimate of the likelihood of clinical depression in this population we followed other research studies using a higher cut of 20/21, with greater likelihood of identifying clinically relevant depressive symptomology (Cho & Kim, 1998). The Cronbach alpha for CESD was 0.84 for women and 0.84 for men.

### Secondary variables

In order to assess earnings we asked a single item, 'How much did you earn in the past month?' This broad approach sought to capture both formal and informal earnings. This item was categorised into earning R0, R1-R500 and > R501, following Jewkes, Sikweyiya, Morrell, and Dunkle (2011) and indicates available income. Given the complexity of young people's earning patterns and livelihoods in informal settlements (Gibbs et al., 2014), we did not ask questions about assets or other earnings.

A range of questions assessed livelihoods. Food insecurity was a single binary item 'How often would you say you go without food because of lack of money?' Responses ranged from every day, every week but not every day, every month but not every week, it happens but not every month, to never. This was recoded into every day or every week (= 1) or less than (= 0). We assessed stealing because of hunger with a single item, 'How often in the past month have you taken something that was not yours because you did not have enough food or money?' with response options never, once, two or three times and more often. This was recoded into never/once (= 0) or two or more times (=1). Finally, we assessed borrowing because of hunger, with 'How often in the past month have you had to borrow food or money because you did not have enough?' with the same options as the previous item and the same recoding of responses. All livelihoods items had previously been used in rural South Africa successfully (Jewkes et al., 2006).

Stress related to not having enough work was assessed using a four-item scale, typical items included: 'I am frequently stressed or depressed because of not having enough income' ( $\alpha = 0.62$  for men;  $\alpha = 0.62$  for women). Feelings about work situation were measured on a four-item scale, with a four-point Likert scale. Items include: 'I sometimes feel ashamed to face my family because I am out of work.' ( $\alpha = 0.66$  for men;  $\alpha = 0.55$  for women), with a four-point Likert Scale. Both scales were taken from the IMAGES study, a global study in five countries, which developed these (Fleming et al., 2015), higher scores represent less stress and feelings of shame.

We measured problem drinking with the Alcohol Use Disorders Identification Test (AUDIT)-scale (Saunders, Aasland, Babor, De la Fuente, & Grant, 1993). Ten items assessed alcohol use; it was treated as continuous variable ( $\alpha = 0.79$  for men;  $\alpha = 0.72$

for women). In descriptive statistics we used the recommended cut of 8 (Jewkes et al., 2006; Saunders et al., 1993). We asked one question on illegal drug use, 'In the past 3 months have you used dagga or tik or mandrax or any other drug?' We used a binary response of yes/no.

Life circumstances were assessed using a five-item scale ( $\alpha = 0.62$  and  $\alpha = 0.77$  for men and women respectively). Typical questions included: 'The conditions of my life are excellent' with responses on a five-point Likert scale ranging from 'Strongly Agree' to 'Strongly Disagree', with lower scores indicative of better life circumstances.

Gender attitudes were measured with a 20-item scale ( $\alpha = 0.79$  for men and  $\alpha = 0.78$  for women), drawing on the Gender Equitable Men Scale (GEMS) (Jewkes et al., 2006; Pulerwitz & Barker, 2008). Typical questions included 'There are times when a woman deserves to be beaten' and 'People should be treated the same whether they are male or female.' Responses were on a five-point Likert scale ranging from 'Strongly Agree' to 'Strongly Disagree'. Larger scores indicated more gender equitable attitudes.

Relationship control was measured with an eight-item scale, adapted for South Africa based on the Sexual Relationship Power Scale (SRPS) (Jewkes et al., 2006). Items included, 'I tell my partner who she can spend time with' (reworded for women), with a four-point Likert scale from 'Strongly Agree' to 'Strongly Disagree' ( $\alpha = 0.67$  men;  $\alpha = 0.71$  women). Larger scores indicated less controlling behaviours by men.

Men were asked about perpetration of IPV and experience of IPV for women, using modified World Health Organisation (WHO) violence against women scales adapted and used previously in South Africa (Jewkes et al., 2006; Jewkes et al., 2011). Physical and sexual IPV were assessed with five and four questions respectively focused on lifetime perpetration/experience. After the lifetime questions, a single binary question asked, 'Have you done any of these things in the past 12 months?' anyone who responded positively to the past 12 month question (either physical and/or sexual IPV) was coded as experiencing or perpetrating IPV in the past 12 months. Men were also asked about perpetration of non-partner sexual violence in their lifetime with four items followed by a binary past 12 month question (Jewkes et al., 2006).

Finally, participation in crime in the past three months was also measured with a ten-item scale ( $\alpha = 0.67$  for men;  $\alpha = 0.86$  for women). This assessment of crime participation had been previously developed and used in rural South Africa (Jewkes et al., 2006).

All questionnaires were translated from English into Zulu and then checked by another Zulu first-language speaker. Translated questionnaires were checked through two focus-groups with young people from informal settlements, where comprehension of individual items was systematically assessed.

### **Statistical analysis**

Data were entered using EpiInfo 7 and was rechecked manually. Analyses were conducted in STATA/IC 13.0 with individuals as the unit of analysis. Men and women were analysed separately. The lower cut for CES-D was used for all analyses. Descriptive statistics were first calculated comparing those with depressive symptomologies to those without on all secondary variables. Pearsons Chi-Squared tests were used to measure associations for categorical variables; if cell size was below five we used a Fishers exact test.

We constructed logistic regression models for women and men separately. Because of the small sample size, in each model we added all variables that were significant in



descriptive analysis, before conducting backwards elimination by consecutively removing variables that are not making a statistically significant contribution to the model and then providing model re-estimates for remaining predictors. The backward method is recommended because it is less likely to incur Type II error (Bingham & Fry, 2010).

As this was an exploratory analysis with a small sample of participants, for all initial inferential analyses, alpha was set at  $\alpha = 0.1$ . In the regression we undertook backward elimination of variables to find what variables were significant in the adjusted model at  $\alpha = 0.05$ . Given the small sample we did not adjust for confounding variables as these were not significant in models nor did they change the results by more than 5%.

## Results

Prevalence of depressive symptomology amongst women and men was high. Using the standard cut (15/16) for CES-D, 72.0% of women and 74.8% of men reported moderate or high levels of symptoms. With the higher cut-point, which is potentially more relevant for diagnosing clinically relevant depressive symptoms (Cho & Kim, 1998), the proportion was lower, but remained very high with 57.9% of women and 49.5% of men reporting depressive symptomology. All analyses used the lower cut.

Table 1 shows background demographic statistics for women and men. The majority of participants were under 25 (86% of men, 82% of women). Half the men (46.5%) and a quarter of women (26.2%) had completed secondary education. Just under half the men and 41% of women said they were a member of a church. The overwhelming majority of women (80.4%) and men (87.9%) reported they currently had a main partner. While two-thirds of women and one third of men reported they had a child. In descriptive analysis having less education was significantly associated with depressive symptoms for men ( $p = .05$ ) and women ( $p = .04$ ). For women having a current partner was associated with depressive symptoms for women ( $p = .09$ ), but for men the association was reversed where not having a partner was associated with depressive symptoms, but this was not significant (Fishers = 0.51).

Table 2 shows descriptive statistics for livelihood measures and substance use. Broadly for women and men measures of livelihood insecurity and concerns about lack of work were associated with depressive symptomologies. For men greater stress about lack of work was associated with depressive symptomologies ( $p = .06$ ) as was having more negative feelings towards lack of work ( $p = .0003$ ). For women, similar associations were seen, with greater stress about lack of work positively associated with higher levels of depressive symptoms (Fishers exact < 0.0001). Direct measures of food insecurity were also associated with depressive symptoms. For men, experiencing hunger daily or weekly (Fishers exact = 0.05) and having stolen in the last month because of hunger (Fishers exact = 0.001) were associated with greater reported depressive symptoms. For women, food insecurity (Fishers exact = 0.01), stealing in the last month because of hunger ( $p = .007$ ) and borrowing food or money weekly or more because of not having enough (Fishers exact = 0.02) were associated with greater depressive symptoms. However, in terms of direct earnings for women, those reporting higher earnings in the past month (11.3% of the sample > R501) reported greater depressive symptoms (Fishers = 0.03). While alcohol use was not associated with depressive symptoms for women ( $p = .75$ ) or men ( $p = .26$ ), use of illegal drugs in the past three months was in men (Fishers exact = 0.004).

**Table 1.** Background descriptive statistics and relationship to depressive symptomology.

	Men				Women			
	Total	No depression (low cut)	Depressive symptoms (low cut)	p-Value (Chi-squared)	Total	No depression (low Cut)	Depressive symptoms (low cut)	p-Value (Chi-squared)
<i>Background</i>	<i>n(%)</i>	<i>n(%)</i>	<i>n(%)</i>		<i>n(%)</i>	<i>n(%)</i>	<i>n(%)</i>	
Age ( <i>n</i> = 107)					<i>n</i> = 106			
<19	22(20.6)	6(27.3)	16(72.7)	Fishers = 0.54	33(31.1)	11(33.3)	22(66.7)	<i>p</i> = .77
20–24	70(65.4)	19(27.1)	51(72.9)		54(50.9)	15(27.8)	39(72.2)	
>25	15(14.0)	2(13.3)	13(86.7)		18(18.0)	4(21.1)	15(78.9)	
Education ( <i>n</i> = 107)					<i>n</i> = 107			
Primary or some secondary	57(53.3)	10(17.5)	47(82.5)	<i>p</i> = .05	79(73.8)	18(22.8)	61(77.2)	<i>p</i> = .04
School completion or higher	50(46.7)	17(34.0)	33(66.0)		28(26.2)	12(42.9)	16(57.1)	
Church Membership ( <i>n</i> = 103)					<i>n</i> = 107			
Yes	51(49.5)	12(23.5)	39(76.5)	<i>p</i> = .54	44(41.1)	10(22.7)	34(77.3)	<i>p</i> = .31
No	52(50.5)	15(28.8)	37(71.2)		63(58.9)	20(31.7)	43(68.3)	
Relationship ( <i>n</i> = 107)					<i>n</i> = 107			
Partner (Yes)	94(87.9)	25(26.6)	69(73.4)	Fishers= 0.51	86(80.4)	21(24.4)	65(75.6)	<i>p</i> = .09
Partner (No)	13(12.1)	2(15.4)	11(84.6)		21(19.6)	9(42.9)	12(57.1)	
Children ( <i>n</i> = 107)					<i>n</i> = 107			
Yes	38(35.5)	11(28.9)	27(71.1)	<i>p</i> = .51	73(68.2)	19(26.0)	54(74.0)	<i>p</i> = .50
No	69(64.5)	16(23.2)	53(76.8)		34(31.8)	11(32.4)	23(67.6)	



**Table 2.** Associations between livelihoods and depressive symptomology (using 15/16 cut).

	Men				Women			
	Total	No depression (low cut)	Depressive symptoms (low cut)	p-Value (Chi-squared)	Total	No depression (low cut)	Depressive symptoms (low cut)	p-Value (Chi-squared)
<i>Livelihoods/work</i>								
Earnings last month (n = 107)					n = 107			
None	50(46.7)	10(20.0)	40(80.0)	p = .70	77(72.6)	26(33.8)	51(66.2)	Fishers = 0.03
R1–R500	28(26.2)	8(28.6)	20(71.4)		17(16.0)	4(23.5)	13(76.5)	
>R501	29(27.1)	9(31.0)	20(69.0)		12(11.3)	0(0.0)	12(100.0)	
Work stress (n = 105)					n = 106			
High stress	41(39.0)	7(17.1)	34(82.9)	p = .06	31(29.2)	1(3.2)	30(96.8)	Fishers < 0.0001
Mid	39(37.1)	8(20.5)	31(79.5)		38(35.8)	11(29.0)	27(71.1)	
Low	25(23.8)	11(44.0)	14(56.0)		37(34.9)	18(48.6)	19(51.4)	
Feelings about work (n = 107)					n = 105			
Negative feelings (<9)	59(55.1)	8(13.6)	51(86.4)	p = .0003	47(44.8)	11(23.4)	36(76.6)	p = .07
Positive feelings	48(44.9)	19(39.6)	29(60.4)		58(55.2)	19(32.8)	39(67.2)	
Food insecurity (n = 107)					n = 107			
Daily/Weekly	26(24.3)	3(11.5)	23(88.5)	Fishers = 0.05	25(23.4)	2(8.0)	23(92.0)	Fishers = 0.01
Less	81(75.7)	24(29.6)	57(70.4)		82(76.6)	28(34.1)	54(65.9)	
Steal in last month hungry (n = 106)					n = 107			
Yes	36(33.6)	2(5.6)	34(94.4)	Fishers = 0.001	51(47.7)	8(15.7)	43(84.3)	p = .007
No	70(65.4)	25(35.7)	45(64.3)		56(52.3)	22(39.3)	34(60.7)	
Borrowing weekly or more (n = 106)					n = 107			
Yes	18(17.0)	4(22.2)	14(77.8)	Fishers = 1.0	33(30.8)	4(12.1)	29(87.9)	Fishers = 0.02
No	88(83.0)	23(26.1)	65(73.9)		74(69.2)	26(35.1)	48(64.9)	
<i>Psychological-</i>								
Alcohol problem (n = 107)					n = 107			
Yes	44(41.1)	8(30.2)	36(69.8)	p = .26	25(23.4)	6(29.3)	19(70.7)	p = .75
No	63(58.9)	19(18.2)	44(81.8)		82(76.6)	24(24.0)	58(76.0)	
Drugs past 3 months (n = 107)					n = 107			
Yes	36(33.6)	3(8.3)	33(91.7)	Fishers = 0.004	19(17.8)	3(15.8)	16(84.2)	Fishers = 0.26
No	71(66.4)	24(33.8)	47(66.2)		88(82.2)	27(30.7)	61(69.3)	
Views re: life circumstances (n = 107)					n = 106			
Positive (low score)	47(43.9)	12(57.1)	35(74.5)	p = .83	28(26.4)	12(42.9)	16(57.1)	p = .14
Mid	41(38.3)	9(82.6)	32(78.0)		46(43.4)	8(17.4)	38(82.6)	
Negative (high score)	19(17.8)	6(68.8)	13(68.4)		32(30.2)	10(31.3)	22(68.8)	

Associations between gender attitudes and violent behaviours and depression are presented in Table 3. For men, gender inequitable attitudes and behaviours were associated with increased depressive symptomology. Lower gender equitable scores for men were positively associated with depressive symptomology ( $p = .03$ ), as were lower scores in terms of controlling behaviours in relationships (indicating more controlling behaviours) ( $p < .0001$ ). 44.8% of men reported perpetration of IPV in the past year ( $p = .11$ ) and 32.1% reported non-partner rape ( $p = .2$ ) neither were associated with depressive symptoms. For men, reporting participation in any crime in the past three months was associated with higher levels of depressive symptomology ( $p = .02$ ). Women who reported experiencing more controlling behaviours from a partner were more depressed (Fishers = 0.01) as did the 39.6% of women who experienced any IPV in the past 12 months ( $p = .001$ ).

In adjusted regression analysis (Table 4), for men three variables remained significant. Measures of weak livelihoods were associated with depressive symptoms. Men who had reported better feelings about lack of work reported reduced depressive symptoms (aOR 0.75,  $p = .01$ ), while men who had stolen in the past month because of hunger reported greater depressive symptoms (aOR 5.78,  $p = .03$ ). There was a significant relationship between men's controlling behaviours and depressive symptoms, where men who were less controlling had less depressive symptoms (aOR 0.81,  $p = .008$ ).

For women in the adjusted regression analysis only two variables remained significant at  $p < .05$ , both related to the high levels of poverty. Hunger, defined as being hungry weekly or daily in the past four weeks, was significantly related to increased depressive symptoms (aOR 5.57,  $p = .039$ ), while having less stress around lack of work lead to significantly reduced depressive symptoms (aOR 0.72,  $p < .0001$ ).

## Discussion

Our findings suggest there are very high levels of depressive symptomology amongst young women and men residing in urban informal settlements in South Africa. Using the higher cut of the CES-D ( $\geq 21$ ) to estimate clinical depression, men's depressive symptomology was 49.5%. Using the lower, more commonly reported cut ( $\geq 16$ ) men's depressive symptoms were 74.8%. Both estimates are much higher than a slightly younger, rural cohort with 13.6% symptomology (Nduna et al., 2010) and 25.0% in an urban township population of older men (Smit et al., 2006). Similarly, for women with the higher cut, prevalence of depressive symptomology was 57.9% and 72.0% with the lower cut, compared to 21.1% in the rural population (Nduna et al., 2010) and 42.3% in the township population (Smit et al., 2006). Representative population studies in South Africa suggest 20.9% of men and 26.4% of women report depressive symptomology (Ardington & Case, 2010). The higher levels of depression in urban informal settlements has also been documented in other South African studies, but tended to be amongst older people (Ardington & Case, 2010).

Given that globally and in South African studies, women show more depressive symptoms, this study evidenced a more equitable split, with women and men showing similar prevalence of depressive symptoms. While the above results are not definitive indicators of clinical depression, the evaluated levels of depression symptoms in this population is of concern. The finding suggests that there may be a large burden of undiagnosed mental

**Table 3.** Associations between sexual risk behaviours, violence and depressive symptomology (using 15/16 cut).

	Men				Women			
	Total	No depression (low cut)	Depressive symptoms (low cut)	p-Value (Chi-squared)	Total	No depression (low cut)	Depressive symptoms (low cut)	p-Value (Chi-squared)
<i>Gender and violent practices</i>								
Gender attitudes (n = 106)					n = 104			
High (equitable)	29(27.4)	11(37.9)	18(62.1)	p = .03	40(38.5)	13(32.5)	27(67.5)	Fishers = 0.22
Mid	25(23.6)	7(28.0)	18(72.0)		33(31.7)	11(33.3)	22(66.7)	
Low (conservative)	52(49.1)	9(17.3)	43(82.7)		31(29.8)	5(16.1)	26(83.9)	
Relationship Control (n = 105)					n = 102			
High (equitable)	16(15.2)	8(50.0)	8(50.0)	p < .0001	39(38.2)	17(43.6)	22(56.4)	Fishers = 0.01
Mid	40(38.1)	13(32.5)	27(67.5)		34(33.3)	4(11.8)	30(88.2)	
Low (controlling)	49(46.7)	6(12.2)	43(87.8)		29(28.4)	7(24.1)	22(75.9)	
Any IPV Past Year (n = 105)					n = 106			
Yes	47(44.8)	9(19.1)	38(80.9)	p = .11	42(39.6)	8(19.0)	34(81.0)	p = 0.001
No	58(55.2)	18(31.0)	40(69.0)		64(60.4)	21(32.8)	43(67.2)	
Non-partner rape (past year) (n = 106)								
Yes	34(32.1)	6(17.6)	28(82.4)	p = .20				
No	72(67.9)	21(29.2)	51(70.8)					
Participation in crime (n = 106)					n = 105			
Yes	42(39.6)	6(14.3)	36(85.7)	p = .02	37(35.2)	9(24.3)	28(75.7)	p = .36
No	64(60.4)	21(32.8)	43(67.2)		68(64.8)	21(30.9)	47(59.1)	

**Table 4.** Factors associated with depression (15/16 cut) in men and women.

Men adjusted regression $p < .05$ , wald $p < .0001$ , residual degrees of freedom = 100			
Variable	Adjusted odds ratio	CI (95%)	$p$ -Value
Feelings about lack of work (< worse feelings)	0.75	0.61–0.93	.01
Stealing in the past four weeks because of hunger (no = 0; yes = 1)	5.78	1.18–28.3	.03
Controlling behaviours towards partner (>is less controlling)	0.81	0.69–0.95	.008
Women adjusted regression $p < .05$ , wald $p < .0001$ , residual degrees of freedom = 103			
Variable	Adjusted Odds Ratio	CI (95%)	$p$ -Value
Stress about lack of work (< more stressed)	0.72	0.61–0.85	.0001
Hungry daily or weekly (no = 0; yes = 1)	5.57	1.09–28.5	.039

health problems in this population, given the paucity of mental health services, in general, and specifically for urban informal settlements.

Our findings are consistent with understandings of depression that emphasise how wider social and economic marginalisation contribute to poor mental health outcomes in women and men (Lorant et al., 2003; Nduna & Jewkes, 2012). Earnings in the past month were not associated in the regression model with depressive symptoms for women or men, however, this may have been because of the homogenous range of earnings, with 72% of men and 88% of women earning R500 (US\$50) or less in the past month.

Other measures of poverty, beyond monthly earnings, were significant in the adjusted regressions. For men, greater feelings of shame linked to a lack of work (aOR 0.75,  $p = .01$ ) and stealing because of hunger (aOR 5.78,  $p = .03$ ) were all associated with depressive symptoms. While for women, those less stressed about lack of work had reduced symptoms of depression (aOR 0.72,  $p < .0001$ ), while experiencing hunger in the past week or daily increased women's depressive symptoms (aOR 5.57,  $p = .039$ ). As such, other measures of socio-economic inequality potentially provided a better way of understanding subtle differences in socio-economic wellbeing in this relatively poor group of young people.

Economic marginalisation was particularly acute for young women in this setting, with mean earnings in the past month being R120 (CI95% R102–R245) (US\$12). There was a direct relationship for women between measures of poverty, specifically food insecurity and stress about lack of work and depression. A similar finding was found by Kuo et al. (2012) in their analysis of factors associated with depression amongst predominately female carers of orphans in South Africa, where depression was strongly associated with food insecurity. In other South African studies, other 'markers' of economic marginalisation such as less education and lower socio-economic status have also been found to be linked to depressive symptoms (Ardington & Case, 2010). It similarly reflects global evidence that direct measures of food insecurity and stress about lack of work are more consistent predictors of depression, rather than income (Lund et al., 2010).

For men, there was a significant relationship between depressive symptoms and controlling behaviours towards partners (aOR 0.81,  $p = .016$ ), whereby men who were less controlling were less depressed. Qualitative research on young men in urban informal settlements has highlighted how young, poor, men unable to attain a 'traditional' masculinity linked to economic provision have sought to establish identity and respect through controlling female partners (Gibbs et al., 2014; Jewkes & Morrell, 2010). Controlling partners may be an attempt to reduce feelings of inadequacy (and depression) many men faced in not being able to provide in relationships. Similarly the association found between men

feeling ashamed about their lack of work and higher depressive symptoms is likely linked to an understanding of masculinity where work is highly valued, but not attainable for this group of men because of widespread unemployment (Gibbs et al., 2014; Hunter, 2010). This is similar to global research that has linked men's depression to a failure to achieve 'traditional' expectations of masculinity (Coleman, 2015).

This study had a number of limitations. First the small sample size meant many factors associated with depression in descriptive analysis were not significant in multivariate analysis. Second, given the high levels lack of variance in the income measure in this population potentially accounted for a non-significant association with depression. Or, earnings in the past month may be a poor proxy for wealth in this population, given the central role of government grants (particularly the child support grant), inter-household transfers and other strategies potentially not reported in shaping people's economic well-being. Third, given the cross-sectional nature of this study, for all associations the temporal sequence is uncertain and need to be more clearly delineated in future longitudinal studies. Fourth, given that community level factors such as widespread violence and social disorganisation are also associated with depression (Tomita et al., 2014), that this study did not measure these is a significant gap. Finally, we did not collect data on which informal settlement participants came from, which means cluster effects may have been missed.

## Conclusion

The strong associations between food insecurity and other measures of stress and shame related to lack of work and symptomatic depression for women and men in this population raise significant questions about the role economic approaches to reducing depression. Current evidence-based approaches to reducing depression tend to focus on either medicalised treatment (Gijsman, Geddes, Rendell, Nolen, & Goodwin, 2004), cognitive-behavioural therapies (Cuijpers et al., 2013) or psychotherapeutic approaches, such as interpersonal therapy (Petersen, Bhana, Baillie, & Consortium, 2012). These models can be hard to roll out in highly marginalised populations given the high costs of delivery and weak systems in South Africa.

This study emphasises there may be significant benefit in working to reduce socio-economic stresses in young people's lives, whether through the provision of direct social grants (Plagerson et al., 2011) or interventions that support young people to strengthen their livelihoods. Currently a growing body of evidence suggests cash transfers have the potential to reduce depressive symptoms, including amongst young people (Haushofer & Fehr, 2014; Lund et al., 2011). However, other economic interventions have had much more mixed outcomes on mental health outcomes, in particular, micro-finance interventions, whereby participants have to repay loans, have been shown to increase participants' stress (Lund et al., 2011). It also raises significant questions about the best way to deliver population level mental health interventions, given limited government capacity.

The study also emphasised the gendered nature of depression and how masculinities and femininities play a role in shaping depressive symptoms. Working to transform masculinities and femininities towards more gender equitable ones may be beneficial. Models such as Stepping Stones and Program H which use group-based approaches to encourage

young people to question gender norms have been shown to have a positive effect in building gender equality. Integrating mental health interventions into these may be an important component of strengthening these interventions. Indeed, qualitative research exploring processes of change have highlighted these associations, particularly amongst men (Gibbs, Jewkes, Sikweyiya, & Willan, 2015; Hatcher, Colvin, Ndlovu, & Dworkin, 2014).

This exploratory analysis has highlighted how socio-economic marginalisation plays an important role in shaping depression in this highly vulnerable population of young people in urban informal settlements. Given that poor mental health and depression are associated with high disease burden, and the growing number of informal settlements as contexts of vulnerability, working to reduce the exceedingly high levels of symptomatic depression in this population remains a critical challenge.

## Acknowledgements

We would like to thank the other team members who were part of the wider study, specifically: Nwabisa Jama-Shai, Yandisa Sikweyiya, Laura Washington, Alison Misselhorn and Samantha Willan. We would also like to thank the fieldwork staff and the participants for sharing their experiences with us.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Funding

The original study was funded by the Swedish International Development Agency (Sida), Norwegian Agency for Development Cooperation (Norad), the Joint Gender Fund (South Africa) and the Medical Research Council of South Africa (SAMRC). Funding for this analysis comes from: A. G. and K. G., Sida and Norad. A. G. and R. J. received funding from DFID. This document is an output from the What Works to prevent Violence: A Global Programme which is funded by the UK Aid from the UK Department for International Development (DFID) for the benefit of developing countries. However, the views expressed and information contained in it are not necessarily those of or endorsed by DFID, Sida, Norad, or the Joint Gender Fund, which can accept no responsibility for such views or information or for any reliance placed on them.

## ORCID

Andrew Gibbs  <http://orcid.org/0000-0003-2812-5377>

## References

- Ardington, C., & Case, A. (2010). Interactions between mental health and socioeconomic status in the South African national income dynamics study. *Tydskrif vir studies in ekonomie en ekonometrie= Journal for Studies in Economics and Econometrics*, 34(3), 69–85.
- Bingham, N., & Fry, J. (2010). *Regression: Linear models in statistics*. London: Springer.
- Cho, M. J., & Kim, K. H. (1998). Use of the center for epidemiologic studies depression (CES-D) scale in Korea. *The Journal of Nervous and Mental Disease*, 186(5), 304–310.

- Coleman, D. (2015). Traditional masculinity as a risk factor for suicidal ideation: Cross-sectional and prospective evidence from a study of young adults. *Archives of Suicide Research*, 19(3), 366–384.
- Cuijpers, P., Berking, M., Andersson, G., Quigley, L., Kleiboer, A., & Dobson, K. S. (2013). A meta-analysis of cognitive-behavioural therapy for adult depression, alone and in comparison with other treatments. *Canadian Journal of Psychiatry*, 58(7), 376–385.
- Dawes, A. (1985). Politics and mental health: The position of clinical psychology in South Africa. *South African Journal of Psychology*, 15(2), 55–61.
- Devries, K., Mak, J., Bacchus, L., Child, J., Falder, G., Petzold, M., ... Watts, C. (2013). Intimate partner violence and incident depressive symptoms and suicide attempts: A systematic review of longitudinal studies. *PLoS Medicine*, 10(5), e1001439, 1–11.
- Emslie, C., Ridge, D., Ziebland, S., & Hunt, K. (2006). Men's accounts of depression: Reconstructing or resisting hegemonic masculinity? *Social Science & Medicine*, 62(9), 2246–2257.
- Fleming, P. J., McCleary-Sills, J., Morton, M., Levitov, R., Heilman, B., & Barker, G. (2015). Risk factors for men's lifetime perpetration of physical violence against intimate partners: Results from the international men and gender equality survey (Images) in eight countries. *Plos One*, 10(3), e0118639, 1–18.
- Fulu, E., Jewkes, R., Roselli, T., Garcia-Moreno, C., & UN Multi-Country Cross Sectional Study on Men and Violence. (2013). Prevalence of and factors associated with male perpetration of intimate partner violence: Findings from the UN Multi-country cross-sectional study on men and violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e187–e207.
- Gibbs, A., Jewkes, R., Sikweyiya, Y., & Willan, S. (2015). Reconstructing masculinity? A qualitative evaluation of the stepping stones and creating futures intervention in urban informal settlements in South Africa. *Culture, Health & Sexuality*, 17(2), 208–222.
- Gibbs, A., Sikweyiya, Y., & Jewkes, R. (2014). 'Men value their dignity': Securing respect and identity construction in urban informal settlements in South Africa. *Global Health Action*, 7(1), 1–10.
- Gijsman, H. J., Geddes, J. R., Rendell, J. M., Nolen, W. A., & Goodwin, G. M. (2004). Antidepressants for bipolar depression: A systematic review of randomized, controlled trials. *American Journal of Psychiatry*, 161(9), 1537–1547.
- Gore, F. M., Bloem, P. J., Patton, G. C., Ferguson, J., Joseph, V., Coffey, C., ... Mathers, C. D. (2011). Global burden of disease in young people aged 10–24 years: A systematic analysis. *The Lancet*, 377(9783), 2093–2102.
- Hatcher, A. M., Colvin, C. J., Ndlovu, N., & Dworkin, S. L. (2014). Intimate partner violence among rural South African men: alcohol use, sexual decision-making, and partner communication. *Culture, Health & Sexuality*, 16(9), 1023–1039. doi:10.1080/13691058.2014.924558
- Hatcher, A. M., Tsai, A. C., Kumbakumba, E., Dworkin, S. L., Hunt, P. W., Martin, J. N., ... Weiser, S. D. (2012). Sexual relationship power and depression among HIV-infected women in rural Uganda. *Plos One*, 7(12), e49821, 1–7.
- Haushofer, J., & Fehr, E. (2014). On the psychology of poverty. *Science*, 344(6186), 862–867.
- Hunter, M. (2010). *Love in the time of AIDS: Inequality, gender, and rights in South Africa*. Durban: University of KwaZulu-Natal Press.
- Jewkes, R., Gibbs, A., Jama-Shai, N., Willan, S., Misselhorn, A., Mbatha, N., ... Sikweyiya, Y. (2014). Stepping stones and creating futures intervention: Shortened interrupted time series evaluation of a behavioural and structural health promotion and violence prevention intervention for young people in informal settlements in Durban, South Africa. *BMC Public Health*, 14, 1325. doi:10.1186/1471-2458-14-1325
- Jewkes, R., & Morrell, R. (2010). Gender and sexuality: Emerging perspectives from the heterosexual epidemic in South Africa and implications for HIV risk and prevention. *Journal of the International AIDS Society*, 13, 6. doi:10.1186/1758-2652-13-6
- Jewkes, R., Nduna, M., Levin, J., Jama, N., Dunkle, K., Khuzwayo, N., ... Duvvury, N. (2006). A cluster randomized-controlled trial to determine the effectiveness of stepping stones in preventing HIV infections and promoting safer sexual behaviour amongst youth in the rural Eastern Cape, South Africa: Trial design, methods and baseline findings. *Tropical Medicine & International Health*, 11(1), 3–16. doi:10.1111/j.1365-3156.2005.01530.x



- Jewkes, R., Sikweyiya, Y., Morrell, R., & Dunkle, K. (2011). The relationship between intimate partner violence, rape and HIV amongst South African men: A cross-sectional study. *Plos One*, 6(9), e24256, 1–6.
- Kuo, C., Operario, D., & Cluver, L. (2012). Depression among carers of AIDS-orphaned and other-orphaned children in Umlazi Township, South Africa. *Global Public Health*, 7(3), 253–269.
- Lennon, C. A., Huedo-Medina, T. B., Gerwien, D. P., & Johnson, B. T. (2012). A role for depression in sexual risk reduction for women? A meta-analysis of HIV prevention trials with depression outcomes. *Social Science & Medicine*, 75(4), 688–698.
- Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: A meta-analysis. *American Journal of Epidemiology*, 157(2), 98–112.
- Lund, C., Breen, A., Flisher, A. J., Kakuma, R., Corrigall, J., Joska, J. A., ... Patel, V. (2010). Poverty and common mental disorders in low and middle income countries: A systematic review. *Social Science & Medicine*, 71(3), 517–528.
- Lund, C., De Silva, M., Plagerson, S., Cooper, S., Chisholm, D., Das, J., ... Patel, V. (2011). Poverty and mental disorders: Breaking the cycle in low-income and middle-income countries. *The Lancet*, 378(9801), 1502–1514.
- Mair, C. F., Roux, A. V. D., & Galea, S. (2008). Are neighborhood characteristics associated with depressive symptoms? A critical review. *Journal of Epidemiology and Community Health*. doi:10.1136/jech.2007.066605
- Nduna, M., & Jewkes, R. (2012). Disempowerment and psychological distress in the lives of young people in Eastern Cape, South Africa. *Journal of Child and Family Studies*, 21(6), 1018–1027.
- Nduna, M., Jewkes, R. K., Dunkle, K. L., Shai, N. P., & Colman, I. (2010). Associations between depressive symptoms, sexual behaviour and relationship characteristics: A prospective cohort study of young women and men in the Eastern Cape, South Africa. *Journal of the International AIDS Society*, 13(1), 1–8.
- Patel, V., Flisher, A. J., Hetrick, S., & McGorry, P. (2007). Mental health of young people: A global public-health challenge. *The Lancet*, 369(9569), 1302–1313.
- Petersen, I., Bhana, A., Baillie, K., & Consortium, M. R. P. (2012). The feasibility of adapted group-based interpersonal therapy (IPT) for the treatment of depression by community health workers within the context of task shifting in South Africa. *Community Mental Health Journal*, 48(3), 336–341.
- Petersen, I., Swartz, L., Bhana, A., & Flisher, A. J. (2010). Mental health promotion initiatives for children and youth in contexts of poverty: The case of South Africa. *Health Promotion International*, 25(3), 331–341. doi:10.1093/heapro/daq026
- Plagerson, S., Patel, V., Harpham, T., Kielmann, K., & Mathee, A. (2011). Does money matter for mental health? Evidence from the child support grants in Johannesburg, South Africa. *Global Public Health*, 6(7), 760–776.
- Pretorius, T. (1991). Cross-cultural application of the center for epidemiological studies depression scale: A study of black South African students. *Psychological Reports*, 69(3f), 1179–1185.
- Pulerwitz, J., & Barker, G. (2008). Measuring attitudes toward gender norms among young men in Brazil development and psychometric evaluation of the GEM scale. *Men and Masculinities*, 10(3), 322–338.
- Radloff, L. S. (1977). The CES-D scale a self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1(3), 385–401.
- Reiss, F. (2013). Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review. *Social Science & Medicine*, 90, 24–31.
- Saunders, J. B., Aasland, O. G., Babor, T. F., De la Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, 88(6), 791–804.
- Smit, J., Myer, L., Middelkoop, K., Seedat, S., Wood, R., Bekker, L.-G., & Stein, D. (2006). Mental health and sexual risk behaviours in a South African township: A community-based cross-sectional study. *Public Health*, 120(6), 534–542.

- Thapar, A., Collishaw, S., Pine, D. S., & Thapar, A. K. (2012). Depression in adolescence. *The Lancet*, 379(9820), 1056–1067.
- Tomita, A., Labys, C. A., & Burns, J. K. (2014). The relationship between immigration and depression in South Africa: Evidence from the First South African national income dynamics study. *Journal of Immigrant and Minority Health*, 16(6), 1062–1068.
- Tomlinson, M., Grimsrud, A. T., Stein, D. J., Williams, D. R., & Myer, L. (2009). The epidemiology of major depression in South Africa: Results from the South African stress and health study. *SAMJ: South African Medical Journal*, 99(5), 368–373.
- Tsai, A. C., & Burns, B. F. (2015). Syndemics of psychosocial problems and HIV risk: A systematic review of empirical tests of the disease interaction concept. *Social Science & Medicine*, 139, 26–35.
- WHO & UN-Habitat. (2010). *Hidden cities: Unmasking and overcoming health inequities in urban settings*. Retrieved from [http://www.who.int/kobe\\_centre/publications/hidden\\_cities2010/en/](http://www.who.int/kobe_centre/publications/hidden_cities2010/en/)