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Original article

Effects of Stigma on the Mental Health of Adolescents Orphaned by AIDS

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Abstract

Purpose: By 2010, an estimated 18.4 million children in Sub-Saharan Africa will be orphaned by AIDS. Research in South Africa shows that AIDS orphanhood is independently associated with heightened levels of psychological problems. This study is the first to explore the mediating effects of stigma and other factors operating on a community level, on associations between AIDS orphanhood and mental health. We assessed the associations of four risk factors that can potentially be addressed at a community level (bullying, stigma, community violence, and lack of positive activities) with psychological problems and orphanhood status.

Method: One thousand twenty-five participants aged 10–19 were recruited from deprived urban settlements in South Africa. The sample included adolescents orphaned by AIDS (n = 425), adolescents orphaned by non-AIDS causes (n = 241), and nonorphaned adolescents (n = 278). Participants were interviewed using standardized psychological measures of depression, anxiety, posttraumatic stress, peer problems, delinquency, and conduct problems. Information on risk factors and demographic characteristics were also assessed.

Results: AIDS-orphaned adolescents reported higher levels of stigma and fewer positive activities than other groups. There were no reported differences on bullying or community violence. All community-level risk factors were associated with poorer psychological outcomes. Multivariate analyses controlling for age and gender showed that experience of stigma significantly mediated associations between AIDS orphanhood and poor psychological outcomes.

Conclusions: Reduction of AIDS-related stigma could potentially reduce adverse psychological outcomes among AIDS-orphaned adolescents.

Keywords: AIDS; Stigma; Mental health; Orphans

Orphanhood is a major consequence of the AIDS epidemic in Sub-Saharan Africa. By 2020, a predicted 2.3 million children in South Africa will be orphaned [1]. Evidence suggests that AIDS-orphaned adolescents experience particular risk for psychological distress, especially internalizing problems such as depression. Although some studies show higher externalizing problems, such as conduct disorder, others find no evidence of differences between AIDS orphans and other groups [2]. The present study compares 1025 adolescents in Cape Town, South Africa. AIDS orphans are compared to two control groups: adolescents orphaned by other causes, and nonorphans. In previous analyses, AIDS orphanhood (but not other orphanhood) was found to be independently associated with depression, posttraumatic stress, peer relationship problems, delinquency, and conduct problems, controlling for sociodemographic factors such as age, gender, and household size [3]. Compared to clinical cutoffs (not validated in a Sub-Saharan context), AIDS orphans showed above-normal proportions of clinical-range scores for internalizing distress, and below or average proportions for externalizing distress.

In South Africa, 19% of the total child population will be orphaned by 2010 [4]. Such high population proportions of orphans suggests that interventions aiming to

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alleviate psychological problems may be more feasible on a community, rather than individual basis. Indeed, evidence from the wider field of adolescent mental health suggests that psychological problems are predicted by risk factors that operate to some extent at the level of the whole community as well as at an individual level. It is important to identify risk factors that are influenced by community norms and resources, and that are thus potentially able to be addressed by group or community-level interventions. We tested risk factors that can operate at a community level, and that have been reported among AIDS orphans in South Africa, including bullying, stigma, community violence, and lack of opportunities for positive recreational activities [5]. In our qualitative pilot study in Cape Town [6], participants (120 orphans and caregivers) identified bullying, AIDS-related stigma, witnessing or experiencing community violence, and lack of sports and other activities as factors they considered important in their psychological health. Whether these factors statistically mediate the association between AIDS orphanhood and mental health outcomes has not yet been examined. Exploring the extent to which community-level risk and protective factors account for increased levels of distress can usefully inform policy and services for AIDS-orphaned adolescents.

High levels of AIDS-related stigma and discrimination has been reported among affected communities in South Africa, ranging from subtle rejection to physical assault and, rarely, murder [7]. There is increasing qualitative evidence that uninfected orphans suffer from stigma associated with parental death [5]. Qualitative research in South Africa reports bullying, discrimination [8], gossip, taunting, and verbal abuse of surviving HIV+ parents [6]. Experience of stigma can reduce levels of social support and increase a sense of isolation for already vulnerable groups. No known studies explore associations of AIDS-related stigma and mental health among noninfected but AIDS-affected adolescents. However, there is evidence of associations between AIDS-related stigma and psychological distress among HIV+ adults [7], and with poor self-worth among youth in AIDS-affected families [5].

Further hypothesized risks to orphans' mental health are high levels of bullying and of community violence in poor, urban settlements. Violent environments can contribute to trauma and learned delinquent behavior, and studies show associations between levels of experienced violence and psychopathology among South African children [9]. A potential protective factor is positive recreational activities, such as sports. Activities are frequently part of youth-focused community interventions, aiming to improve peer relationships and provide opportunities for achievement. Limited evidence from the developed world suggests associations between positive recreational activities and better psychological outcomes [10].

Specific aims of this paper are the following: (1) to examine associations between orphanhood and community risk factors, (2) to examine associations between community risk factors and psychological outcomes, and (3) to examine the extent to which community risk factors mediate associations between AIDS orphanhood (compared to other orphanhood and nonorphanhood) and psychological outcomes.

Methods

Participants

The sample comprised 1025 children and adolescents: 425 were orphaned by AIDS, 241 orphaned by other causes, and 278 who were not orphaned. Eighty-one were excluded from analyses because of uncertainty regarding cause of parental death. The study used the UN definition of orphanhood as loss of one or both parents [4], and followed the World Health Organization definition of adolescence as 10 to 19 years [11]. To increase generalizability, we purposively sampled populations unlikely to be included in school-based surveys, including streetchildren (via shelters and feeding schemes), child-headed and youth-headed households, and non school-attending adolescents. From 2005 to 2006, participants were recruited from 9 schools (507 adolescents), 18 Non-Governmental organizations (304 adolescents), and door-to-door sampling (214 adolescents). AIDS-orphaned participants were identified and subsequently matched to nonorphaned and other orphaned controls. Where orphans were recruited from schools and organizations that serve both orphans and nonorphans, a randomly chosen sample of nonorphans in the same grade and class was selected. Where projects were orphan-specific, orphans were matched to controls in the same community, selected through random door-to-door sampling and matched by gender and age. All participants lived in deprived urban areas of Cape Town, marked by high levels of violent and acquisitive crime, AIDS-related stigma, and poor infrastructure [12].

In South Africa, death certificates are unreliable sources of data. Cause of parental death was determined using the "verbal autopsy" method, validated in several Sub-Saharan African countries [13]. Determination of AIDS-related parental death required the presence of three or more AIDS-defining illnesses, that is, oral candidiasis, Kaposi's sarcoma, or HIV wasting syndrome [14]. Where diagnoses were in doubt, symptoms were reviewed by two independent medical practitioners. Non-AIDS causes of deaths included vehicle accidents (24%), homicide (28%), and suicide (3%). AIDS-unrelated illnesses such as diabetes and hypertension were coded as non-AIDS deaths only in cases where there were no other potentially AIDS-related symptoms. Where cause of death was unknown or uncertain (81 adolescents), cases were excluded from all main analyses (Tables 1–3). These included deaths attributed to "bewitchment" and deaths of tuberculosis with no other AIDS-defining symptoms.

Table 1
Group differences on sociodemographic and community factors

	Adolescents orphaned by AIDS (n = 425)	Adolescents orphaned by other causes (n = 241)	Nonorphaned adolescents (n = 278)
Sociodemographic variables			
Age (mean, SD)**	13.70 (2.52)[a]	13.38 (13.38)[b]	13.02 (2.01)[c]
Female (%)	50.6[a]	43.2[a]	46.4[a]
Xhosa ethnicity–overall sample (%)	98.1[a]	96.7[a]	96.4[a]
Household size[1] (mean, SD)**	4.78 (1.93) [a]	4.61 (1.71) [a]	5.25 (2.02)[b]
Informal dwelling[2] (%)**	43.0[a]	43.0[a]	29.1[b]
Internal migration (%)	41.4[a]	44.0[a]	40.6[a]
Moved b/w 2 or more homes (%)	66.4[a]	69.3[a]	71.6[a]
Loss of mother (%)**	58.6[a]	28.2[b]	—
Loss of father (%)*	66.1[a]	83.0[b]	—
Loss of both parents (%)**	24.9[a]	12.4[b]	—
Age, first bereavement (mean, SD)**	10.1 (3.82) [a]	7.8 (4.56)[b]	—
Community variables			
Bullying[3] (mean, SD)	13.65 (5.39)[a]	13.34 (4.67)[a]	14.30 (5.39)[a]
Name-calling or swearing (%)	35.8	38.6	45.0
Causing troubles with friends (%)	30.9	33.6	38.8
Stealing child's possessions (%)	40.7	41.7	50.4
Making fun of child (%)	35.8	38.3	50.4
Intimidation by standing close or touching**	25.5	26.2	32.0
Punched, kicked, or beat child up	31.8	33.2	29.3
Hurt child physically in some way	26.0	23.0	24.5
Broke or damaged possessions	31.6	26.1	28.4
Refused to talk to child	28.0	27.8	35.3
Community traumas (mean, SD)	1.65 (1.32)[a]	1.89 (1.38)[a]	1.82 (1.35)[a]
Robbed in the past year (%)**	46.4	39.8	28.4
Assaulted outside the home (%)	12.7	12.9	14.4
Witnessed shootings (%)	30.4	34.9	31.4
Witnessed stabbings (%)**	39.2	52.5	50.7
Stigma (mean, SD)**	2.39 (2.57)[a]	1.20 (2.22)[b]	.54 (1.37)[c]
Teased about family illness (%)**	39.4	20.7	7.9
Treated badly (%)**	38.0	19.5	6.5
Gossiped about (%)**	48.3	22.0	13.3
Upset "very much" by stigma (%)**	31.7	18.8	9.1
Positive activities (mean, SD)**	6.10 (2.02)[a]	6.82 (2.28)[a]	6.29 (2.27)[b]

Note: Different superscripts reflect statistically different means ($p < .01$) tested using *post hoc* comparisons.

** Significant at $p < .001$; * significant at $p < .01$.

[1] Number of cases reduced because of exclusion of streetchildren who moved between shelters and streets. For AIDS-orphaned adolescents, n = 403; adolescents orphaned by other causes, n = 223; nonorphans, n = 265.

[2] Number of cases reduced because of exclusion of streetchildren. For AIDS-orphaned adolescents, n = 402; adolescents orphaned by other causes, n = 221; nonorphans, n = 261.

[3] Number of cases reduced because of missing data. For adolescents orphaned by AIDS, n = 408; adolescents orphaned by other causes, n = 235; nonorphaned adolescents, n = 275.

Procedure

Ethical protocols were approved by Oxford University, the University of Cape Town, and by the Department of Education (Western Cape). Participation was voluntary, and informed consent was obtained from participants and caregivers. Interviewers were local, Xhosa-speaking social workers, psychologists, or community health workers, trained in working with AIDS-affected families. With interviewers, adolescents completed anonymous self-report questionnaires lasting 40–60 minutes. The interviewing method was adjusted according to adolescents' literacy level and personal choice, and a combination of verbal, written, and drawing techniques were used. For example, some adolescents preferred interviewers to ask questions verbally and record responses, whereas others read items or wrote responses themselves. Participants received refreshments and certificates, and participating organizations received staff training. Confidentiality was maintained, except where participants were at risk of significant harm or requested assistance.

Measures

Psychological distress was measured using a range of standardized scales: Child Depression Inventory [15], Children's Manifest Anxiety Scale—Revised [16], peer problems and conduct problems subscales of the Strengths and

Table 2
Correlations between community factors and mental health outcomes

	Depression	Anxiety	Peer problems	Posttraumatic stress	Delinquency	Conduct problems
Victim of bullying scale	.293*	.468*	.327*	.455*	.360*	.386*
No of community traumas	.137*	.235*	.194	.237*	.266*	.228*
Stigma total score	.364*	.376*	.467*	.640*	.384*	.318*
No. of positive activities	−.179	−.116*	−.137*	−.139*	−.014	−.038

* Significant at $p < .01$.

Difficulties Questionnaire [17], Child PTSD Checklist [18], and delinquent subscale of the Child Behavior Checklist [19]. All have been shown to be reliable, and have been used previously with vulnerable youth in Cape Town. Further information on psychometric properties is reported in Cluver et al [3].

Demographics characteristics included individual and household-level factors such as age, gender, migration, age at orphanhood, dwelling type, and household size.

Community-level factors.

Bullying was measured with the nine-item Social and Health Assessment Peer Victimization Scale [20], used in recent research in Cape Town [21]. This scale is adapted from the Multidimensional Peer Victimization Scale [22], and showed $\alpha = .82$ in a U.S. validation study. Items included: being called names, being hit or threatened, and having possessions broken or stolen. Bullying events were scored on a four-point Likert scale, ranging from "not at all" to "more than four times" in the past year.

Exposure to community trauma was measured by self-report of past-year experience of witnessing or having been a victim of the study area's four most common community crimes: robbery, assault, stabbings, and shootings [23]. The fifth category was witnessing or experiencing any further trauma, and these were coded into broad categories such as "crime," "accidents," and "rape." Wording was adapted from the Child Exposure to Community Violence Checklist [24]. Number of exposure events was summed, with the total possible score of 5.

No standardized instruments currently exist to measure AIDS-related stigma among orphans. A brief four-item stigma scale was devised, based on items from the Berger Stigma Scale for HIV-positive youth–Revised [25]. This was adapted for noninfected orphans using (a) qualitative interviews with 120 youth [6], (b) literature review, and (c) consultation with local academics currently researching stigma [26,27]. Participants reported frequency of experiencing teasing, being treated badly, and being gossiped about, because of the illness of a family member. Adolescents reported both the frequency of events (never/sometimes/very often), and the extent to which these events caused distress (not at all/somewhat/very much). Scale reliability was good, with $\alpha = .83$ for stigmatizing events, and $\alpha = .88$ when including extent of distress. Scale values were computed for each participant, with a total possible score of 8.

A measure of access to positive community activities was devised from a prior qualitative study of activity preferences [6]. Items included were: playing a musical instrument, playing netball, soccer or another sport, dancing,

Table 3
Multivariate associations between orphanhood by AIDS, orphanhood by other causes, and psychological outcomes, controlling for sociodemographic cofactors and AIDS-related stigma

	Depression[1]		Anxiety[1]		Peer Problems[2]		PTSD[3]		Delinquency[4]		Conduct problems[5]	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
AIDS orphan	.182**	.053	.074	−.069	.260**	.103*	.272**	.041	.132††	−.007	.149**	.032
Other orphan	.032	−.009	−.005	−.049	.038	−.001	.074	.016	.020	−.023	.023	−.014
Stigma		.339**		.390††		.435**		.634**		.386**		.309**
Change R^2	.053	.100	.027	.132	.091	.157	.099	.333	.066	.125	.038	.082
F Change		109.92**		141.67**		181.98**		506.80**		143.34**		86.16**

Note: AIDS orphan and other orphan groups are compared with nonorphan group.
** Significant at .001; * significant at .05.
[1] Model 1 controls for age, gender.
[2] Model 1 controls for age, household size, >2 moves between homes.
[3] Model 1 controls for age, gender, household size, >2 moves between homes.
[4] Model 1 controls for age, gender, migration, >2 moves between homes.
[5] Model 1 controls for age, gender, migration.

socializing with friends, using a computer, reading, and family outings. There were 13 possible activities, with a score range of 0–13, where activity participation was defined as performing at least weekly.

Statistical analyses

Analyses followed five general procedures. First, differences between orphanhood groups on demographic characteristics and community factors (Table 1) were assessed using chi-square tests and one-way analysis of variances (ANOVAs). Second, associations between community factors and psychological outcomes were examined using bivariate correlations (Table 2). Where factors were associated with both psychological outcomes and orphanhood status, they met criteria to be examined as a potential mediating variable between the two [28]. Third, multivariate linear regression analyses (Table 3) were used to assess associations between orphan status (orphaned because of AIDS and orphaned because of other causes) with each psychological outcome (depression, anxiety, posttraumatic stress, peer problems, delinquency, and conduct problems). Two models are presented for each outcome. Model 1 examined associations between orphan status and psychological outcome, adjusting for demographic cofactors that were previously shown to be associated with orphanhood group at $p < .2$ in Table 1 [29]. Model 2 further included four community factors as additional explanatory variables: community violence, bullying, stigma, and positive recreational activities. Backward elimination was used to remove independent variables with the largest p-value and refitted the model until all remaining variables had independent p-values less than .05, thereby yielding parsimonious models for each outcome. Reductions in coefficients between Model 1 and Model 2 were indicative of a mediational effect of stigma on the association between orphan status and psychological outcome [28]. Fifth, indirect effects associated with stigma were then assessed using the Sobel test [30] for all psychological outcomes where regression analyses showed significant change in variance explained between Models 1 and 2.

Data were analyzed using SPSS (Version 14.0). All tests were two tailed, and significance was set at the $p < .01$ level because of the number of comparisons made.

Results

Associations between orphanhood and community risk factors

Descriptive properties of the four measured community risk factors are described in Table 1. Overall levels of bullying and experience of community traumas were high, but showed no group differences. Significant group differences on stigma and positive activities were observed. One-way ANOVAs showed that AIDS orphans reported significantly more stigma than other orphans ($p < .001$), and that other orphans reported more stigma than nonorphans ($p < .001$). AIDS orphans were more likely to report experience of any stigma (55% of AIDS orphans compared to 27% of other orphans and 17% of nonorphans, $p < .001$, $\chi^2 = 83.2$). AIDS orphans and other orphans reported significantly fewer positive activities than nonorphans ($p < .001$).

Associations between community risk factors and psychological outcomes

Being a victim of bullying and stigma were each associated with higher scores on depression, anxiety, peer problems, posttraumatic stress, delinquency, and conduct problems ($p < .001$); community violence was associated with each outcome except peer problems (Table 2). A greater number of positive activities was associated with lower scores on depression, anxiety, peer problems, and posttraumatic stress, but not on conduct or delinquency problems.

Community-level factors mediating associations between AIDS-orphanhood and psychological outcomes

AIDS orphans in this study showed higher levels of psychological problems than both nonorphans and other orphans [3]. Table 3 presents multivariate models demonstrating (a) the direct association between orphanhood status and each psychological outcome (controlling for demographic cofactors), and (b) associations between community factors, orphanhood status, and each psychological outcome. Each outcome is considered separately. Backward elimination removed bullying, community trauma, and number of positive activities from each model. Stigma was retained in each model, suggesting that stigma was the only community-level variable accounting for the association between orphanhood group and psychological outcomes. Mediational analyses were tested (Figure 1) where there was a significant change in R^2 between Models 1 and 2.

Depression Controlling for age and gender, orphanhood by AIDS was significantly related to higher depression ($\beta = .182$, $p < .001$), and this association was eliminated when stigma was accounted for in the model ($\beta = .053$, $p < .159$). Orphanhood by other causes was not associated with depression in either the unadjusted or adjusted models. Sobel tests showed that stigma fulfilled criteria for full mediation [28] between AIDS orphanhood and depression ($p < .001$).

Anxiety Controlling for age and gender, AIDS orphanhood was not associated with anxiety ($\beta = .074$, $p < .06$). The adjusted model, controlling for stigma, also showed no relationship ($\beta = -.069$, $p < .073$). Other orphanhood was not associated with anxiety in either the unadjusted or adjusted models. As no relationship was shown, further tests of mediation were not conducted.

Peer problems Controlling for age, household size, and more than two moves between homes, AIDS orphanhood was significantly associated with higher peer relationship problems ($\beta = .260$, $p < .001$). When stigma was included,

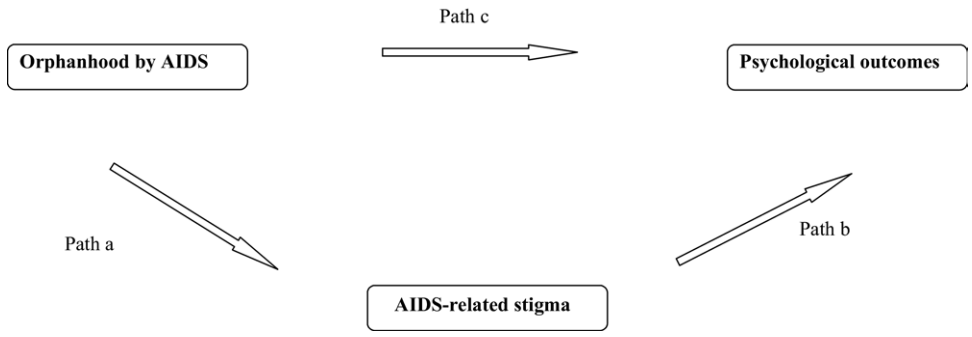

Figure 1. Mediation model.

the association remained significant but was weakened ($\beta = .103$, $p < .005$). Other orphanhood was not associated with peer problems in either the unadjusted or adjusted models.

Posttraumatic stress Controlling for age, gender, household size, and more than two moves between homes, AIDS orphanhood was significantly associated to higher posttraumatic stress ($\beta = .272$, $p < .001$), but this association was eliminated when stigma was accounted for ($\beta = .041$, $p < .202$). Other orphanhood was not associated with posttraumatic stress in either the unadjusted or adjusted models. Sobel tests showed that stigma fulfilled criteria for full mediation between AIDS orphanhood and posttraumatic stress ($p < .001$).

Delinquency Controlling for age, gender, internal migration, and two or more moves between homes, AIDS orphanhood was significantly related to higher delinquency ($\beta = .132$, $p < .001$), but this association was eliminated when stigma was accounted for ($\beta = -.007$, $p < .849$). Positive activities did not have a significant association with delinquency. Other orphanhood was not associated with delinquency in either the unadjusted or adjusted models. Sobel tests showed that stigma fulfilled criteria for full mediation between AIDS orphanhood and delinquency ($p < .001$).

Conduct problems Controlling for age, gender, and internal migration, AIDS orphanhood was significantly related to higher conduct problems ($\beta = .149$, $p < .001$), but this association was eliminated when stigma was accounted for ($\beta = .032$, $p < .405$). Positive activities did not have a significant association with conduct problems. Other orphanhood was not associated with conduct problems in either the unadjusted or adjusted models. Sobel tests showed that stigma fulfilled criteria for full mediation between AIDS orphanhood and conduct problems ($p < .001$).

Discussion

This study highlights the emergence of a group at high risk of adverse psychological outcomes. AIDS-orphaned adolescents have been shown to be at particular risk for mental health problems of depression, peer problems, posttraumatic stress disorder, and behavior problems. Levels of anxiety showed no differences, perhaps reflecting the exceptionally high levels of community violence affecting most children in the study areas, irrespective of orphan group [23]. AIDS-orphaned children are also at higher risk for social and economic hardship associated with AIDS deaths in the family. Targeted interventions to address these problems are necessary. Emerging evidence suggests that financial support is an important area of intervention, and more details on associations between poverty, school attendance, AIDS orphanhood, and mental health can be found elsewhere.

However, this study provides clear evidence that the social impacts of AIDS orphanhood are also impacting on orphan mental health. Experience of AIDS-related stigma was shown to strongly mediate the association between AIDS orphanhood and depression, posttraumatic stress, conduct problems, and delinquency. For peer problems, group differences were reduced but remained significant. For AIDS orphans, other community factors did not explain psychological outcomes above and beyond the impact of orphanhood, and did not reduce associations of orphanhood and psychological problems. These findings suggest that intervention programs aimed at the reduction of stigma for orphans may have the potential to alleviate psychological problems associated with the impacts of AIDS orphanhood.

This study provides the first quantitative exploration of stigma among uninfected AIDS orphans in South Africa. It finds higher levels of reported stigma among AIDS orphans than other adolescents. This is supported by prior qualitative research with AIDS-orphaned children, suggesting stigma-related distress [5]. Stigma research has typically focused on HIV-infected children and adults [31,32], although there is general evidence of stigma directed at HIV/AIDS-affected families [31,33]. There is a clear need for further research on experience of stigma for noninfected orphans.

Stigma reduction is a complex and difficult area. No known studies evaluate effects of stigma reduction strategies on AIDS orphans. Reviews of strategies aiming to reduce stigma toward HIV-infected people suggest positive results of legal protection and provision of antiretrovirals in

reducing public fears of HIV [34]. A review of 21 studies notes the paucity of quality research on stigma reduction (especially in the developing world), but finds impacts of community interventions including provision of information around HIV, counseling, group desensitization toward HIV, and contact with HIV+ people [35]. It remains to be tested whether these strategies also reduce stigma toward AIDS-orphaned adolescents.

Methodological limitations of this study include the lack of standardized psychological questionnaires validated in South Africa, although all scales had been previously used in Cape Town. The retrospective study design does not allow distinction of orphanhood and pre-orphanhood distress, and longitudinal data is necessary to determine effects of any anti-stigma and activity-based interventions.

The stigma scale used asked about experienced stigma because of "illness," which in the context of urban African townships was a proxy term for HIV/AIDS-related illness. In an environment of low disclosure and high secrecy around HIV/AIDS, asking directly about AIDS-related illness would have resulted in adolescents afraid to admit experience of stigma. However, the far higher proportions of reported stigma among AIDS orphans (55%, compared to 27% of other orphans and 17% of nonorphans) suggest that the scale was tapping the correct construct.

Stigma items in this study referred to the illness of "someone in your family," and high HIV prevalence in study areas (around 28%) means that adolescents in both the AIDS orphaned and control groups were likely to have AIDS-affected family members [36]. However, experience of AIDS-related stigma among controls would have had the expected effect of reducing group differences, and differences remained significant. On the other hand, only a small number of adolescents in the other orphaned and nonorphaned groups (0% and 15%) reported experiencing neither bereavement in their immediate family, nor illness among their caregivers. This means that it is unlikely that the group differences in the stigma measure could be attributed to the fact that much fewer adolescents in the non-AIDS orphans groups had experienced any family illness.

Adolescents' perceptions of stigma and psychological outcomes may also be influenced by their own HIV status. Rates of HIV testing in South Africa, and in the research area, are extremely low [33]. It was very unlikely that the sample included any children who had been perinatally infected, as survival rates into adolescence (before the 2004 rollout of antiretroviral medication) were minimal [37]. Any adolescents who were observed to be AIDS unwell or who disclosed HIV+ status were excluded from the study ($n = 32$). However, HIV prevalence for Western Cape adolescents is estimated at 2%–6%, implying that a small proportion of participants may have been infected postnatally, with potential neurocognitive effects of even asymptomatic HIV. The potential for HIV+ status was highest among the group of streetchildren who were interviewed, most of who engaged in transactional sex. It is important that future research explores further the potential effects of HIV status on AIDS-orphaned adolescents.

A final limitation is the risk of method overlap: adolescents who were more depressed, traumatized, or had conduct problems may have felt more isolated and threatened, and thus perceived higher levels of stigma. However, adolescents' experience of stigma can only be measured by self-report, and perceived stigma is inherently at least partially subjective. To limit method overlap, items focused as much as possible on actual specific acts of harassment (such as being teased) reflecting the stigma of AIDS. The nature of the sample also precluded the use of alternative (i.e., caregiver or teacher) informants for psychological outcomes: 6% of AIDS-orphaned adolescents did not attend school, and class sizes of 50–70 were judged to limit teacher capacity to report psychopathology. The use of caregiver report would have introduced systematic bias of poorer reporting for adolescents living on the streets, in child-headed households, and with very unwell or distressed caregivers [38].

Strengths of this study should also be noted. This is the only study known to measure experience of AIDS-related stigma, access to positive recreational activities, bullying, or community trauma among AIDS-orphaned adolescents. This is the largest study known to date to explore the effects of community-related variables on psychological outcomes of AIDS orphans, with control groups of nonorphans and other orphans. It is the only study known to investigate mediating influences of stigma on the psychological well-being of AIDS orphans. Purposive oversampling of difficult-to-reach groups such as child-headed households and streetchildren, allowed for representation of orphan groups usually excluded from school or community samples.

Conclusions

It is crucial that policies are developed to address psychological distress experienced by AIDS-orphaned adolescents. Although some factors addressable at a community level, such as reducing bullying and exposure to community trauma, and increasing positive activities, have potential to improve mental health more generally, AIDS-related stigma was shown to be particularly relevant to AIDS orphans, and to have strong predictive effects on psychopathology. It is essential that interventions are developed to reduce stigma directed at these adolescents, and that these form part of multilevel strategies to reduce economic hardship, improve educational opportunities, and support caregivers within the community. It is also essential that these interventions are rigorously evaluated to determine their effects on psychological well-being.

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