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Poverty and psychological health among AIDS-orphaned children in Cape Town, South Africa

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

Keywords: poverty; psychological health; orphans; HIV/AIDS

Orphanhood is a major consequence of the AIDS epidemic in South Africa, with an estimated 2.2 million AIDS-orphaned children – 11,188 per 100000 children – by 2015 (Dorrington, Johnson, Bradshaw, & Daniel, 2005; Statistics SA, 2006). Evidence suggests that AIDS-orphaned children are at particular risk for psychological distress compared with non-orphans (Nyamukapa et al., 2008). A recent review (Cluver & Gardner, 2007a) found raised rates of depression (Makame, Ani, & McGregor, 2002; Sengendo & Nambi, 1997), anxiety (Atwine, Cantor-Graae, & Bajunirwe, 2005; Pelton & Forehand, 2005), post-traumatic stress (Cluver, Gardner, & Operario, 2007; Makaya et al., 2002) and peer relationship difficulties (Bhargava, 2005; Cluver, Gardner, & Operario, 2008) among AIDS orphans in sub-Saharan Africa.

Distress from orphanhood may be exacerbated due to financial difficulties associated with parental illness and death (Silverman, 2000; Stoppelbein, 2000). Familial AIDS illness has been shown to determine increased household poverty, food insecurity and unemployment (Booysen, 2002). AIDS-orphaned children may experience pressures to assume adult responsibilities, such as caregiving or entering formal or informal labor sectors, which can contribute to lower levels of school enrollment and attendance among AIDS-orphaned children compared with other groups (Gray et al., 2006). Indeed, in a qualitative study of 120 orphaned children and caregivers, participants identified food insecurity, school non-attendance, and lack of welfare grants as substantial threats to health (Cluver & Gardner, 2007b).

General literature on child bereavement has suggested that poverty can be an additional stressor, independent of parental loss, on children's psychological well-being (Dowdney, 2000). No known studies have examined this dynamic among AIDS-orphaned children in developing world settings, such as South African townships where environmental stressors of AIDS-bereavement and acute poverty co-exist.

The present study examines 1025 young people aged 10–19 recruited using targeted sampling from deprived urban areas in South Africa. It compares children orphaned by AIDS to children orphaned by non-AIDS causes and non-orphaned children. Prior analyses have indicated that AIDS-orphaned children experience heightened psychological distress when compared to other children (Cluver et al., 2007). The aims of this paper are twofold: First, to examine associations between orphanhood, poverty, and psychological distress in this sample of South African young people; and second, to assess whether poverty mediates the association between AIDS-orphanhood status and psychological distress. Insight into these associations can inform public health and policy debates on the relevance of poverty alleviation programs for psychological outcomes of orphaned children in South Africa.

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Method

Participants

Participants were recruited between 2005 and 2006 from nine schools, 18 Non-Governmental Organisations (NGOs) and door-to-door sampling. Targeted community sampling strategies were used to recruit adolescent children orphaned due to AIDS, adolescent children orphaned due to other causes of parental death, and non-orphan adolescents, matched according to gender, age, and location. Recruitment strategies over-sampled from groups unlikely to be included in school-based studies, including streetchildren (via shelters and feeding schemes), child-headed and youth-headed households, and non-school-attendees. Social services and NGOs facilitated access to participants who were not enrolled in school. Eligibility criteria adopted the UN definition of orphanhood as loss of one or both parents (UNAIDS, 2004), and the World Health Organisation definition of adolescence as 10–19 years (World Health Organisation, 2003).

Recruitment efforts focused on 1470 km^2 of deprived urban settlements of Cape Town, South Africa, in neighborhoods formerly designated for "black Africans" under apartheid. Study areas were characterized by high population density, for example, 67 people/hectare in Khayelitsha (Statistics South Africa, 2003). The Cape Flats experience extreme levels of property crime, rape and violent crime (South Africa Police Service, 2004). Average income is less than ZAR1500 (UK£100) per month. At the 2001 Census, unemployment in Khayelitsha was 67%, and 51% of residents lived in informal dwellings (Statistics South Africa, 2003). Data collection took place in both informal and formal settlements.

At the time of data collection, all schools were fee-paying. There are a large number of primary schools located throughout residential settlements, but general functional illiteracy in the area was 15% in 2001. In a 2006 survey, 18% of Khayelitsha respondents reported distance to health facility as a problem in accessing services, and 28% reported payment for health services as difficult (Department of Social Development, 2006).

Recruitment strategies yielded a sample of 1025 young people aged 10–19, of whom 425 were orphaned by AIDS, 241 orphaned by non-AIDS causes, and 278 were not orphaned. Orphaned children lived with a range of primary caregivers. For AIDS-orphaned children, 32% lived with a surviving parent (compared to 56% of other-orphans and 74% of non-orphans); 21% lived with a grandparent (8% of other-orphans and 9% of non-orphans); 33% lived with another extended family member, including an adult sibling (20% of other-orphans and 8% of non-orphans); 7% lived in a child-headed household (6% of other-orphans and 1% of non-orphans); and 2–3% of all groups lived with a non-relative primary caregiver. Numbers of streetchildren (5% of AIDS-orphans, 7% other-orphans, 6% non-orphans) were purposively matched across all groups, as no reliable data is available on this population.

Procedure

Participants were screened for study eligibility and underwent informed consent procedures. Informed consent was gained from primary caregivers or from appropriate adults (i.e. social workers) in situations where children had no caregiver. Interviewers were five local, Xhosa-speaking social workers, psychologists or community health workers with prior experience working with AIDS-affected children. Interviewers received additional training on survey administration and research ethics. Children completed face-to-face survey interviews lasting 40–60 minutes. Interviews were designed and piloted to be child-focused, and included games, cartoons and vignettes. Interviews took place in schools, homes and community centers. To exclude children undergoing acute bereavement, participants who had experienced orphanhood status in the previous six months were not interviewed. Following the interview, participants received light refreshments and a certificate of thanks. Confidentiality was maintained, except where children were at risk of significant harm or requested assistance. Research procedures received Internal Review Board approval from Oxford University, the University of Cape Town, and the Department of Education – Western Cape.

Measures

Parental death

Parental death was assessed using the "verbal autopsy" method, which improves on inaccuracies in official death certificates, described in previous studies of adult mortality in South Africa (Hosegood, Vanneste, & Timaeus, 2004). In a South African validation study, sensitivity for adult communicable diseases was found to be 89%, specificity was 93% and positive predictive value 76% (Kahn, Tollman, Garenne, & Gear, 2000). Parental death due to AIDS was determined by the presence of three or more AIDS-defining illnesses, such as oral candidiasis, Kaposi's sarcoma or HIV-wasting syndrome (World Health Organisation, 2005); additional indicators of AIDS death included death of both parents and/or infant deaths of siblings from AIDS-defining illnesses. Non-AIDS causes of

death included road accidents, suicide, and homicide. Child report on cause of parental death was corroborated by teachers, social workers and surviving family, and where diagnoses were in doubt, symptoms were reviewed by two independent medical practitioners. Using these criteria, 81 orphans (11%) were excluded from present analyses, due to unknown or uncertain cause of parental death.

Depression
Depression was measured using the Child Depression Inventory (CDI short form) (Kovacs, 1992). It has been widely used in South Africa, shows good psychometric properties, and has comparable results with the full CDI (Kovacs, 1992).

Anxiety
Anxiety was measured using the 28-item Children's Manifest Anxiety Scale – Revised (R-CMAS) (Reynolds & Richmond, 1978). This shows good reliability and validity (Gerard & Reynolds, 1999) and has been used in South Africa (Wild, Flisher, Laas, & Robertson, 2006).

Peer problems
Peer problems were measured using the five-item peer problems subscale of the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). The SDQ has strong psychometric properties, has been translated into 51 languages, including Xhosa, and has been validated in many developing countries (Goodman, Renfrew, & Mullick, 2000).

Post-traumatic stress
Post-traumatic stress was measured using the 28-item "Child PTSD Checklist," which has been used extensively in Cape Town (e.g. Seedat, Nyamai, Njenga, Vythilingum, & Stein, 2004). The text-based checklist was accompanied by cartoons derived from the Levonn/Andile PTSD scale (Richters & Martinez, 1993), which was found accessible for Xhosa-speaking adolescents in Cape Town (Ensink, Robertson, Zissis, & Leger, 1997).

Conduct problems
Conduct problems were measured using the five item "conduct problems subscale of the SDQ" (Goodman, 1997) and the 11-item delinquent subscale of the Youth Self-Report (YSR) (Achenbach, 1991). The YSR has good psychometric properties (Achenbach & Rescorla, 2001; Song, Singh, & Singer, 1994), and has been used with AIDS-orphaned children (Forehand et al., 2002), and in South Africa (Van der Merwe & Dawes, 2000; Wild et al., 2006).

Demographic and environmental characteristics
Demographic and environmental characteristics included age, gender, age at orphanhood, household size, migration and number of moves between homes.

Poverty indicators
Poverty indicators included access to school, food security, employment in the household, and receipt of welfare grants. Each poverty indicator represented the focus of distinct poverty alleviation programs in South Africa. School enrolment was ascertained from school registers or social workers, corroborated by the child and coded dichotomously as "currently enrolled/not enrolled." Food security was measured as number of days (0–7) without food in the past week, following studies with AIDS-orphaned children in Tanzania (Makame et al., 2002). Following the UN definition of "food security" as constant and adequate nutrition (UNESCO, 1996) and in recognition of poor overall food security in the research area (Cousins, 2004), an "acceptable" threshold was set of "at least five days in the past week with sufficient food," and coded dichotomously as "secure/not secure." Household employment was assessed by "Does anyone in your home have a job?" and was coded dichotomously and corroborated by adult report. Receipt within the household of each of the possible welfare grants available in South Africa (child support grant, foster care grant, pension, war veterans grant, care dependency grant, disability grant, social relief of distress, and grant in aid) were coded as dichotomous variables and corroborated by caregiver or social worker report. They were then combined to determine household receipt of any grant, and coded dichotomously.

Analysis

Although all scales had been previously used in studies with South African children, no standardized psychological scales for this age group have been validated in Southern Africa, and so clinical cut-off scores reflecting Western norms were considered inappropriate. For this reason, all analyses used continuous scores for psychological variables.

Differences between groups (AIDS-orphans, other-orphans, non-orphans) on sociodemographic characteristics and poverty indicators (levels of food security, employment, welfare grants and school

access) were assessed using Chi-square tests for categorical variables or one-way analysis of variance tests (ANOVAs) for continuous variables. Associations between poverty indicators and mental health outcomes were examined using independent sample *t*-tests.

Multivariate linear regression analyses were used to assess associations between each orphan status variable (orphaned due to AIDS and orphaned due to other causes, compared with non-orphaned children) with each mental health outcome (depression, anxiety, post-traumatic stress, peer problems, delinquency, conduct problems). Two models are presented for each outcome. Model 1 presents associations between orphan status and mental health outcome, adjusting for any sociodemographic co-factors (i.e. age, gender, age at orphanhood, household size, internal migration within South Africa, number of moves between homes) that were associated at $p < 0.20$ with each respective outcome in univariate analyses (Hosmer & Lemeshow, 1989). Model 2 further adjusted for poverty indicators expected to mediate the association between orphan status and mental health. A "poverty index" score was derived by summing the four variables of attending school, food security, household employment, and any social security transfer, and this was used in all multivariate regressions. Following from Baron and Kenny (1986), reductions in coefficients between Model 1 and Model 2 were indicative of a mediational effect of poverty on the association between orphan status and mental health outcome (Baron & Kenny, 1986). We then used the Sobel test (Sobel, 1982) to assess the mediating effect of a combined poverty index on the relationship between orphanhood status and psychological outcomes (Figure 1).

Data were analyzed using SPSS (Version 14.0). Mean imputation was used in case of missing values for psychological scales. For demographic variables, missing values were negligible as interviewers were trained to ensure all items were completed. All tests were two-tailed. To reduce likelihood that results capitalize on error, we held our test of statistical significance at the $p < 0.01$ level.

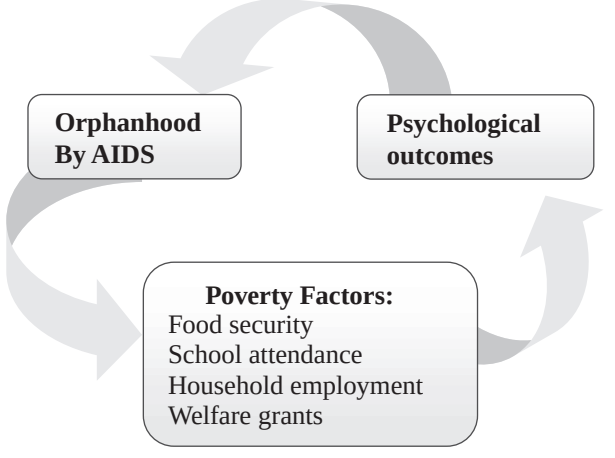

Figure 1. Mediation model.

Results

Orphan status, sociodemographic characteristics, and poverty

Average age of participants was 13.4 years, and significant age differences were observed between each group with AIDS-orphaned children older than other orphans and non-orphaned children (Table 1). Overall, the sample was 53% male and 47% female, with no gender differences in AIDS-orphanhood.

AIDS-orphaned children were more likely to have lost both parents and were older at first parental bereavement than children orphaned by other causes. Among AIDS-orphans, 59% were maternally bereaved, 66% paternally bereaved, and 25% doubly bereaved. Among non-AIDS orphans, 28% were maternally bereaved, 83% paternally bereaved, and 12% doubly bereaved.

Table 1 also shows the associations between orphanhood status and poverty indicators. Overall school attendance was high, though AIDS-orphaned children were less likely to be enroled than other-orphaned or non-orphaned children. AIDS-orphaned children were more likely to report food insecurity and household unemployment than other-orphaned children; non-orphans reported relatively high levels of food security and household employment. All participants lived in poor households eligible for means-tested grants; however, grant uptake was variable. AIDS–orphaned children were less likely to live in a household accessing any grant compared with other-orphans and non-orphans. Both AIDS-orphans and other-orphans lived in smaller households and were less likely to live in formal dwellings compared with non-orphans.

Poverty and mental health outcomes

Table 2 shows results of *t*-tests comparing mental health outcomes by each poverty indicator. Access to school, food security, employment in the household and receipt of any welfare grant were each associated with lower scores on depression, anxiety, peer problems, post-traumatic stress, delinquency and conduct problems.

Table 1. Differences between orphanhood groups on sociodemographic and poverty variables.

	Children orphaned by AIDS ($n=425$)	Children orphaned by other causes ($n=241$)	Non-orphaned children ($n=278$)	p-Value
Socio-demographic variables				
Age (M, SD)	13.70 (2.52)[a]	13.38 (13.38)[b]	13.02 (2.01)[c]	<0.01
Female (%)	50.6[a]	43.2[a]	46.4[a]	ns
Xhosa ethnicity – overall sample (%)	98.1[a]	96.7[a]	96.4[a]	ns
Household size (M, SD)	4.78 (1.93)[a]	4.61 (1.71)[a]	5.25 (2.02)[b]	<0.01
Informal dwelling (%)	43.0[a]	43.0[a]	29.1[b]	<0.01
Internal migration (%)	41.4[a]	44.0[a]	40.6[a]	ns
Moved between two or more homes (%)	66.4[a]	69.3[a]	71.6[a]	ns
Loss of mother (%)	58.6[a]	28.2[b]	–	<0.01
Loss of father (%)	66.1[a]	83.0[b]	–	<0.01
Loss of both parents (%)	24.9[a]	12.4[b]	–	<0.01
Age, first bereavement (M, SD)	10.1 (3.82)[a]	7.8 (4.56)[b]	–	<0.01
Poverty-related variables				
Attending school (%)	93.9[a]	97.1[b]	98.2[b]	<0.01
Food security 5+days/week (%)	65.4[a]	78.0[b]	91.4[c]	<0.01
Any employment in household (%)	50.1[a]	59.8[b]	77.3[c]	<0.01
Any welfare grant (%)	45.9[a]	60.6[b]	64.7[b]	<0.01

Note: P values associated with one-way ANOVA or Chi-square test. Different superscripts reflect statistically different values (each at $p<0.01$).

Multivariate associations between orphan status, poverty, and mental health

Table 3 shows multivariate models on: (a) the association between orphanhood status and each psychological outcome (controlling for relevant socio-demographic co-factors); and (b) associations between orphanhood status, poverty indicators, and each psychological outcome. Each model compared both orphan groups (AIDS orphans and other orphans) with non-orphans as the reference group.

Controlling for relevant socio-demographic co-factors (age, gender, household size and more than two moves between homes), orphanhood by AIDS was significantly related to depression ($p<0.01$), peer problems ($p<0.01$), post-traumatic stress ($p<0.01$) and moderately related to delinquency and conduct problems ($p<0.05$). In the adjusted model controlling for poverty indictors, the association between AIDS-orphanhood and psychological distress was completely eliminated for depression, delinquency and conduct problems, and remained significant but was weakened for peer problems and PTSD. Orphanhood by AIDS was not associated with anxiety in either model. Orphanhood by other causes was not associated with any mental health problems in either unadjusted or adjusted models.

Tests of mediation

We directly tested whether the derived poverty index of the four poverty alleviation factors measured (school access, food security, household employment and access to welfare grants) mediated the association of AIDS-orphanhood and psychological outcomes. We used the Sobel test for mediation (Sobel, 1982). Results showed that the poverty index mediated the association of AIDS-orphanhood with depression ($p<0.01$), peer problems ($p<0.01$), PTSD ($p<0.01$), delinquency ($p<0.01$), and conduct problems ($p<0.01$).

Discussion

Children who are orphaned due to parents' AIDS-illness experience higher risk for adverse psychological outcomes, and interventions to address these problems are necessary. We have examined poverty factors that potentially explain the association between AIDS-orphanhood and psychological problems, focusing on school access, food security, household employment, and household receipt of welfare grants. When combined, this poverty index reduced the association of AIDS-orphanhood with peer problems and PTSD, and eliminated the association of AIDS-orphanhood with depression and conduct problems.

Table 2. Associations between poverty-related factors and mental health outcomes.

	Depression M (SD)	*p*	Anxiety M (SD)	*p*	Peer problems M (SD)	*p*	Post-traumatic stress M (SD)	*p*	Delinquency M (SD)	*p*	Conduct problems M (SD)	*p*
		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01
Attending school												
Yes	2.82 (2.69)		11.41 (5.17)		2.28 (2.12)		15.74 (13.76)		2.42 (2.57)		1.34 (1.49)	
No	5.38 (3.15)		14.53 (7.08)		3.69 (1.73)		31.10 (17.81)		5.11 (4.50)		2.89 (2.27)	
Food security in past week		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01
≥5 days	2.50 (2.59)		10.66 (5.23)		1.99 (2.04)		12.78 (12.24)		2.14 (2.51)		1.20 (1.43)	
<5 days	4.36 (2.79)		14.56 (4.23)		3.51 (1.98)		28.23 (14.02)		3.84 (2.93)		2.09 (1.75)	
Any employment in household		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01
Yes	2.51 (2.57)		11.04 (5.12)		2.06 (2.07)		14.46 (12.87)		2.20 (2.43)		1.25 (1.47)	
No	3.64 (2.91)		12.22 (5.61)		2.84 (2.15)		19.71 (16.31)		2.87 (2.80)		1.61 (1.62)	
Any welfare grant in household		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01
Yes	2.57 (2.61)		11.14 (5.45)		2.03 (2.08)		14.22 (13.76)		2.11 (2.56)		1.22 (1.53)	
No	3.37 (2.86)		12.03 (5.02)		2.71 (2.12)		19.05 (14.35)		3.02 (2.77)		1.62 (1.55)	

Note: Depression assessed using the CDI measure; anxiety assessed using the R-CMAS measure; peer problems assessed using the SDQ peer subscale; post traumatic stress symptoms assessed using the Child PTSD Checklist; delinquency assessed using the Child Behavior Check List subscale; conduct problems assessed using the SDQ Conduct Problems subscale. All *p* values associated with independent sample *t*-test.

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

	Depression[1]		Anxiety[2]		Peer Problems[3]		PTSD[4]		Delinquency[5]		Conduct problems[6]	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Orphanhood by AIDS	0.117**	0.055	0.042	–0.019	0.174**	0.131**	0.195**	0.118**	0.072*	0.016	0.076*	0.030
Orphanhood by other causes	0.011	–0.018	–0.016	–0.044	0.030	0.010	0.065	0.030	–0.010	–0.035	–0.012	–0.032
R-square	0.055	0.094	0.029	0.071	0.058	0.077	0.076	0.132	0.056	0.089	.037	0.058
R-square change		0.040		0.042		0.020		0.056		0.033		0.022
F-change		40.56**		39.15**		18.88**		57.73**		33.44**		21.04**

Note: Model 1 adjusted for sociodemographic co-factors, described below. Model 2 adjusted for poverty indicators: attending school, food security for ≥ 5 days in past week, employment in household and any social security transfer in household.

*Denotes significance at the 0.05 level.

**Denotes significance at the 0.001 level.

1. Model 1 controls for age, gender.
2. Model 1 controls for age, gender.
3. Model 1 controls for age, household size, >2 moves between homes.
4. Model 1 for age, gender, household size, >2 moves between homes.
5. Model 1 controls for age, gender, migration, >2 moves between homes.
6. Model 1 controls for age, gender, and migration.

South Africa has recognized the multidimensional nature of child poverty (Noble, Wright, & Cluver, 2006) and has launched a series of poverty alleviation programs, such as roll-out of free schooling. Our findings suggest that, as well as being valuable in their own right, these poverty programs might potentially improve psychological outcomes for AIDS-orphaned children. However, reach of poverty-alleviation programs to intended beneficiaries can be variable (Department of Social Development, 2008), and so strategies for maximizing receipt of programs may be necessary.

We found that AIDS-orphaned children were consistently disadvantaged on all poverty indicators when compared to other groups. Children orphaned by AIDS reported higher school dropout, food insecurity, and lower adult employment in households than other groups. AIDS-orphans were less likely to live in a household receiving any state grant, which is likely to reflect limited access to welfare support rather than non-eligibility.

Findings of this study suggest potential interventions within South Africa's existing poverty-alleviation strategies. Programs such as school feeding schemes, sustainable food and gardening projects, employment initiatives and targeted assistance for grant applications could have positive mental health impacts on AIDS-orphaned children. Many of these programs are already being piloted. This study also builds on prior evidence from the developed world that increased poverty after parental death can be associated with increased psychological problems (Stoppelbein, 2000).

This study has a number of methodological limitations. First, identifying cause of parental death is problematic in a context of high stigma, low HIV-testing levels, and unreliable death certificates (Hosegood et al., 2004), although the verbal autopsy method was used to improve on official reports by using AIDS-defining illnesses and medical practitioner review to improve reliability of assessment. Second, use of cross-sectional data prohibits temporal or causal explanations; this study cannot tell us whether AIDS-orphaned children were more disadvantaged in terms of poverty and welfare grants prior to orphanhood, or whether they experienced psychological problems prior to orphanhood. Third, interpretations of the mediational effect of poverty on the association between AIDS orphanhood and psychological problems must be made with caution, as it is unclear whether AIDS-orphanhood directly led to increased poverty which then accounted for increased psychological problems. Determining direct and indirect effects of mediating variables may require more complex path analysis strategies, with additional data collection time points. These limitations can be addressed in future research by using multiple assessments, such as longitudinal studies of South African youth, and evaluating the impact of current poverty alleviation programs on outcomes among AIDS-orphaned children. Future studies could also valuably measure children's access to school uniforms, opportunity to do schoolwork, and economic activities undertaken by children.

Strengths of this study design and sampling should be noted. To date, this is the largest study known to explore psychological outcomes among South African children orphaned by AIDS compared to control groups of both non-orphans and children orphaned by non-AIDS causes. The study used well-validated standardized scales with good psychometric properties. The study also included groups frequently omitted from community samples, such as children living on the streets, child-headed and youth-headed households.

The post-apartheid South African government has implemented a range of poverty-alleviation policies aimed at improving well-being of deprived families. There is growing evidence of the positive effects of such policies on child well-being, such as improved school enrolment among recipients of the Child Support Grant (Case, Hosegood, & Lund, 2005). This study suggests that programs that aim to reduce poverty, particularly by improving food security, have the potential to alleviate psychological distress for AIDS-orphaned children.

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