AIDS CARE, 2017
VOL. 29, NO. 3, 399–407
http://dx.doi.org/10.1080/09540121.2016.1220477

Routledge
Taylor & Francis Group

Caregiver alcohol use and mental health among children orphaned by HIV/AIDS in South Africa

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ABSTRACT

Research in the developed world suggests that parental alcohol use negatively impacts child mental health. However, little research has examined these relations among children in the developing world and no studies to date have done so in the context of AIDS-orphanhood. Therefore, the present study tested the interactive effect of AIDS-orphan status with caregiver alcohol use on child mental health. The sample included 742 children (51.2% female; $M_{age} = 9.18$; age range: 7–11 years; 29.8 AIDS-orphans; 36.8% orphaned by causes other than AIDS; 33.4% non-orphaned) recruited from Mangaung in the Free State Province of South Africa. Child mental health was assessed via child self-report, caregiver, and teacher reports; and caregiver alcohol use via self-report. Path analyses, via structural equation modeling, revealed significant direct effects for AIDS-orphan status on caregiver-reported child mental health; and for caregiver alcohol-use problems on teacher-reported child mental health. However, the interaction effect of AIDS-orphan status with caregiver alcohol use did not reach significance on all three reports of child mental health problems. These results suggest that orphan status and caregiver alcohol use may independently relate to mental health problems in children and that the effects of both should be considered in the context of the mental health needs of children in AIDS-affected countries.

ARTICLE HISTORY
Received 5 November 2015
Accepted 1 August 2016

KEYWORDS
HIV/AIDS orphans; mental health; caregiver alcohol-use problems

The number of children orphaned by the HIV/AIDS continues to increase. Between 2001 and 2012, the global number of AIDS-orphans increased from 10 million to 17.8 million, 90% of whom live in Sub-Saharan Africa (United Nations Children's Fund [UNICEF], 2013). As of 2012, five countries have one million or more AIDS-orphans, with current rates for South Africa estimated at 2.5 million (UNICEF, 2013). The detrimental impact of orphanhood on child mental health (Dowdney, 2000; Kranzler, 1990; Paris, Zweig-Frank, & Guzder, 1994) and among AIDS-orphans in particular is well documented (for review: Chi & Li, 2013; Cluver & Gardner, 2007a). Cross-sectional studies show that AIDS-orphans suffer from increased rates of internalizing (e.g., depression, anxiety, and post-traumatic stress; Cluver, Gardner, & Operario, 2007; Li et al., 2009; Onuoha, Munakata, Serumaga-Zake, Nyonyintono, & Bogere, 2009) and externalizing problems (e.g., conduct problems, delinquency, and acting-out; Cluver et al., 2007; Doku, 2009; Sharp et al., 2014; Tu et al., 2009) compared to non-orphans. Prospective studies show that internalizing symptoms in AIDS-orphans increase over time (Cluver, Orkin, Gardner, & Boyes, 2012; Zhao et al., 2011). However, some studies fail to demonstrate a relation between orphan status and mental health problems (e.g., Wild, Flisher, & Robertson, 2013), suggesting that mental health problems may be moderated by child characteristics (e.g., gender and age; Cluver et al., 2013) and contextual factors (Cluver et al., 2013; Cluver, Gardner, & Operario, 2009; Cluver, Orkin, Boyes, Gardner, & Meinck, 2011; Nyamukapa et al., 2008, 2010).

Caregiver characteristics constitute an additional risk factor for orphan mental health problems. Studies of HIV-affected children typically focus on chronic illness in caregivers (Cluver, Operario, & Gardner, 2009). Few focus on caregiver problematic alcohol use as a risk factor for mental health problems in orphans. There are, however, several compelling arguments, suggesting this as an important risk correlate. Studies in *non*-HIV-affected samples show that caregivers' problematic

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alcohol use relates to a variety of negative outcomes for children, including internalizing and externalizing problems (Lindsey et al., 2008; Staton-Tindall, Sprang, Clark, Walker, & Craig, 2013), physical abuse (Freisthler & Gruenewald, 2013), violence exposure (Staton-Tindall et al., 2013), and harsh parenting behaviors (Sorsdahl, Stein, Williams, Anthony, & Myers, 2015). In South Africa, children of caregivers with alcohol/substance-use disorders have a greater likelihood of being abused (Madu, 2002) and of later alcohol-use problems as adults (Sorsdahl et al., 2015). Among South African adolescents, parental modeling of alcohol use increases the likelihood of multiple victimization (Morojele & Brook, 2006) and of adolescents' own alcohol/substance use (Brook, Morojele, Pahl, & Brook, 2006). Given that 10% of the South African population engages in heavy episodic drinking, 5% qualify for an alcohol-use disorder (World Health Organization [WHO], 2014), and alcohol abuse is implicated in a variety of serious public health problems (Ferreira-Borges, Dias, Babor, Esser, & Parry, 2015), more work is needed to understand the effect alcohol is having on caregiving, especially among AIDS-affected children where no work yet exists.

Unique characteristics of caregivers of AIDS-orphans may further compound the negative effects of caregiver alcohol use. In Sub-Saharan Africa, caregivers of orphans are often older and have other children or ill family members under their care (Clausen et al., 2005; Ice, Yogo, Heh, & Juma, 2010). Increased household size depletes already impoverished economic conditions and increases the likelihood of physical illness among caregivers (Govender, Penning, George, & Quinlan, 2012; Muliira & Muliira, 2011). Amidst such financial, physical, and social stressors, caregivers of orphans experience high rates of internalizing problems (Ice et al., 2010; Kuo, Cluver, Casale, & Lane, 2014; Kuo, Operario, & Cluver, 2012) and may resort to the use of alcohol and other substances (Clausen et al., 2005; Cluver & Gardner, 2007b). However, to our knowledge, there have been no empirical studies examining the relation of caregiver alcohol problems with orphan mental health in Sub-Saharan Africa.

The aim of the present study was to examine whether caregiver alcohol-use problems differentially impact the mental health of AIDS-orphans compared with non-AIDS-affected children (other-orphans and non-orphans) in South Africa. Based upon the findings from the developed world (Staton-Tindall et al., 2013), we tested a moderation model in which we predicted that levels of mental health problems would increase as caregiver alcohol-use problems increased, and that this effect would be stronger for AIDS-orphans than for non-AIDS-affected children (Figure 1).

Methods

Participants

Children ($N = 742$; 51.2% female; $M_{age} = 9.18$; SD = 1.37; range: 7–11 years) were recruited from Mangaung Metropolitan Municipality in the Free State Province of South Africa as part of a larger study aimed at the validation of psychometric measures for the South African context. As the third largest province in South Africa, the Free State contains 10.6% of the country's surface and 5.6% of the population (Marais & Pelser, 2006). Mangaung is the largest urban settlement in the Free State. Ethnically, Mangaung is approximately 82% African (mostly Sesotho). Of all children in Mangaung, 31% are orphaned. The sample consisted of 221 (29.8%) children orphaned by AIDS-related causes, 273 (36.8%) orphaned by causes other than AIDS, and 248 (33.4%) non-orphans (i.e., both parents alive). Of the orphaned children, 250 (49.2%) had lost both parents, 91 (17.9%) had lost their mothers only, and 167 (32.9%) had lost their fathers only.

Materials

All study assessment measures were translated according to published guidelines for cross-cultural translation (Gjersing, Caplehorn, & Clausen, 2010; Hambleton, 2001; van de Vijver & Hambleton, 1996). Assessments were first translated independently by two Sesotho native speakers, who then integrated their translations into a single agreed-upon version that was subsequently back-translated into English by a third Sesotho native speaker.

Orphan status. Child orphan status was determined by "Verbal Autopsy", a procedure that has been validated in South Africa (Hosegood, Vanneste, & Timaeus, 2004; Kahn, Tollman, Garenne, & Gear, 2000) and used in previous research in South Africa (Cluver et al., 2007). This method has a sensitivity of 89%, specificity of 93%, and positive predictive value of 76% in South Africa (Kahn et al., 2000). The "Verbal Autopsy" method was used because death certificates are unreliable in reporting cause of death and clinical data are not available.

Caregiver alcohol use problems. The Alcohol Use Disorder Identification Test (AUDIT; Babor, de la Fuente, Saunders, & Grant, 1992) is a 10-item self-report measure of problems resulting from alcohol use. Responses are entered on a 5-point Likert scale ranging from "never" (0) to "daily or almost daily" (4). Total scores range from 0 to 30, with higher scores signifying more severe alcohol-use problems. The AUDIT has good psychometric properties (Babor et al., 1992) and has been used previously in South Africa (Myer et al.,

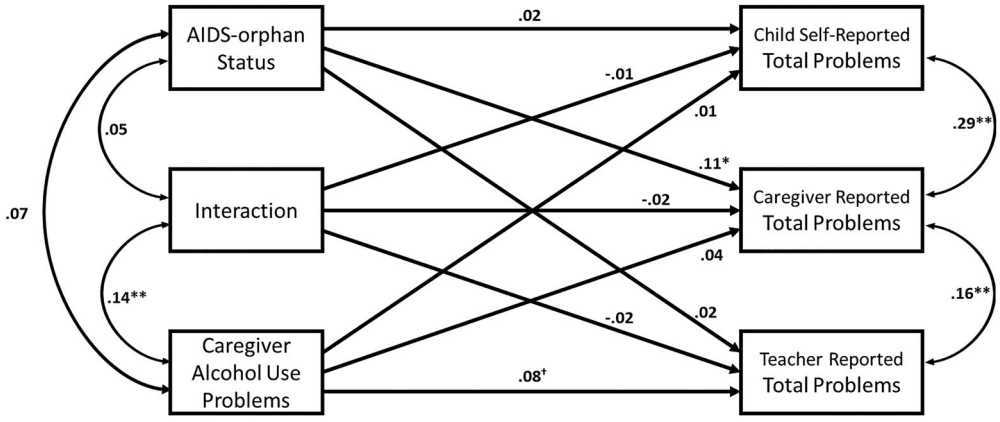

Figure 1. Final model of the interaction of AIDS-orphan status with caregiver alcohol-use problems in relation to total mental health problems based on child, caregiver, and teacher report ($N = 742$).
Note: All parameter estimates are standardized. †$p < .05$, *$p < .01$, **$p < .001$.

2008; Young & Mayson, 2010). In the present study, the AUDIT served as an independent variable and showed excellent internal consistency ($\alpha = .90$).

Mental health problems. The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) is a 25-item assessment of emotional and behavioral problems among children. The SDQ is able to detect and monitor psychological disorders among children (Ford, Hutchings, Bywater, Goodman, & Goodman, 2009; Goodman, Ford, Simmons, Gatward, & Meltzer, 2003; Sharp, Croudace, Goodyer, & Amtmann, 2005). Response options are "not true" (0), "somewhat true" (1), or "certainly true" (2). The SDQ has three forms (SDQ-Child-self-report, SDQ-Caregiver-report, and SDQ-Teacher-report). Each of the report forms has demonstrated good psychometrics (Bourdon, Goodman, Rae, Simpson, & Koretz, 2005; Goodman, 1997, 2001), notably in the South African Sesotho-speaking population (Sharp et al., 2014). However, past work has shown that the caregiver and teacher reports may be more precise estimates of psychopathology than the child self-report version (Goodman, 2001). In the present study, the following Cronbach's alphas were found: SDQ-Caregiver-report (.72), SDQ-Teacher-report (.84), and SDQ-Child-self-report (.62)

Procedures

The present study received approval from relevant ethical boards. Data were collected by trained field workers who administered in-home interviews and surveys. Research participants were recruited by partnering with local non-government organization who used their registries to identify orphans in the Mangaung area. This approach was taken to ensure the inclusion of children not attending school. Once identified, children's caregivers were contacted by study staff and consented face to face, including consent to contact the child's principal class teacher. Data were collected by trained field workers who administered in-home interviews and surveys. Caregiver and child participants completed assessments separately. To account for high rates of illiteracy, study staff read questionnaires and response options to participants in accordance with established research guidelines (Shaw, Brady, & Davey, 2011) so as not to influence participants' answers or breach confidentiality. The senior author provided supervision to study staff via Skype conferencing and face to face throughout the duration of the study.

Data analytic strategy

Bivariate relations were examined using Pearson correlations in SPSS 21.0. Group differences by orphan status were tested via one-way analysis of variance with *post hoc* Tukey comparisons. Using AMOS 21.0, path analysis via structural equation modeling was conducted to examine the a priori hypothesized model (Weston & Gore, 2006). Starting from the hypothesized model, the strength of the significance of the proposed associations was checked before making decision about inclusion or exclusion of each of them in the model. In a stepwise manner, paths that were both theoretically/logically implausible and non-significant were eliminated, and the model was rerun (Billings & Wroten, 1978; Heise, 1975). The model's indices of fit were examined as a criterion for appropriateness of the change. This was continued until there were no theoretically irrelevant paths in the model and the model reached an acceptable model fit.

The hypothesized model examined the relative contributions of caregiver alcohol-use problems, AIDS-orphan status (AIDS-orphans vs. other-orphans/non-orphans), and the interaction of AIDS-orphan status with caregiver

alcohol-use problems (each as exogenous variables) on SDQ-Child-, SDQ-Caregiver-, and SDQ-Teacher-reported child mental health problems (endogenous variables). All variables were transformed into standardized *z*-scores. The interaction between AIDS-orphan status and caregiver alcohol-use problems was computed as the product of the two *z*-scores. All three exogenous variables were correlated with free parameters, whereas all endogenous variables were modeled with corresponding disturbances. In the hypothesized model, the direct effects of caregiver alcohol use and AIDS-orphan status, as well as the interaction effect, were modeled on each of the three endogenous criterion variables. Since no cases of extreme skewness (>3) and kurtosis (>10) were observed, the model utilized maximum likelihood estimation (Kline, 2005).

Child age was not associated with any study variables and was not included in analyses beyond the Pearson correlations. Comparisons of regression weights within the model were made between males and females to determine whether the model was sex invariant. Critical ratios (cut-off of $z = 1.96$) were used to determine differences by gender on any model paths (Hopwood, 2007).

Results

Descriptive results

The descriptive statistics and bivariate correlations for all variables are presented in Table 1. Significant group differences were observed for caregiver alcohol-use problems, as well as SDQ-Caregiver- and SDQ-Teacher-reported child mental health problems (see Table 2).

Path analysis

The hypothesized model was fully saturated (distinct sample moments = 21; free parameters = 21; df = 0). To allow for evaluation of model fit, the correlation between the disturbances of the SDQ-Child-self-report and the SDQ-Teacher report was removed. Since the child and caregiver lived in the same home, the correlation between the disturbances for the SDQ-Child-self-report and the SDQ-Caregiver-report was retained. Since both the caregiver and teacher-report forms were identical, the correlation between the disturbances of the SDQ-Teacher- and SDQ-Caregiver-report forms was retained. The result was an identified model (distinct sample moments = 21; free parameters = 20; df = 1), which also demonstrated good fit ($\chi^2 = 2.057$, $p = .151$; CFI = .990; GFI = .999; RMSEA = .038).

For SDQ-Child-self-reported total problems, neither of the direct effects of AIDS-orphan status ($\beta = .017$, SE = .037, $t = 0.463$, $p = .644$) nor caregiver alcohol-use problems ($\beta = .010$, SE = .037, $t = 0.257$, $p = .797$) were significant. The interaction effect also did not reach significance ($\beta = -.013$, SE = .035, $t = -0.344$, $p = .731$). The hypothesized model accounted for 0.1% of the variance in SDQ-Child-self-reported total problems ($R^2 = .001$).

Concerning SDQ-Caregiver-reported total problems, the direct effect of AIDS-orphan status was significant ($\beta = .105$, SE = .037, $t = 2.873$, $p = .004$), while that of caregiver alcohol-use problems was not significant ($\beta = .038$, SE = .037, $t = 1.036$, $p = .300$). The interaction effect was also not significant ($\beta = -.018$, SE = .035, $t = -0.514$, $p = .607$). The hypothesized model accounted for 1.3% of the variance in SDQ-Caregiver-reported total problems ($R^2 = .013$).

Table 1. Zero-order correlations and descriptive statistics for study variables ($N = 742$).

Variable		1	2	3	4	5	6	7	8
1. Gender[a]		-	−.011	−.048	−.032	−.034	.008	−.066	−.174**
2. Orphan status[b]			-	.461**	.031	−.066	.037	.074†	.141**
3. AIDS-orphan status[b]				-	.026	.065	.017	.106*	.027
4. Age (years)[a]					-	−.013	.001	.044	−.060
5. Caregiver AUDIT[c]						-	.009	.042	.075†
6. SDQ-Child self-report[d]							-	.294**	.054
7. SDQ-Caregiver report[d]								-	.178**
8. SDQ-Teacher report[d]									-
Descriptive Statistics	Mean (*n*)	380	494	221	9.18	3.53	12.11	12.61	14.23
	SD (%)	51.20	66.58	29.78	1.37	6.09	4.95	7.28	6.08

Notes: Correlations among categorical variables (i.e., gender, orphan status, AIDS-orphan status) were calculated using the Phi correlation. Gender, coded male = 0 and female = 1, with descriptive statistics for number and percentage female; Orphan status = orphan or non-orphan, coded as non-orphan = 0 and orphan = 1, with descriptive statistics for number and percentage orphans; AIDS-orphan status = AIDS-orphan or non-AIDS-orphan, coded as non-AIDS-orphan = 0 and AIDS-orphan = 1, with descriptive statistics for number and percentage AIDS-orphans; Age = age in years; Caregiver AUDIT = Caregiver alcohol-use problems, reported as Alcohol Use Disorders Identification Test total scale score; SDQ-Child self-report = SDQ total scale score, child self-report; SDQ-Caregiver report = SDQ total scale score, caregiver/parent report; SDQ-Teacher report = SDQ total scale score, teacher report.

[a]Covariates.
[b]Moderator.
[c]Predictor.
[d]Outcome Variables.
†$p < .05$.
*$p < .01$.
**$p < .001$.

Table 2. Bivariate comparisons of child mental health problems across orphan status ($N = 742$).

	Non-orphans[a]		Other-orphans[b]		AIDS-orphans[c]				
	M	SD	*M*	SD	*M*	SD	*F*(2, 741)	*p*-Value	Contrast
Caregiver AUDIT	4.10	6.35	2.52	5.09	4.14	6.76	6.043	.002	a > b; c > b
SDQ-Child	11.85	4.67	12.24	5.33	12.24	4.77	0.512	.600	N/A
SDQ-Caregiver	13.60	5.81	14.00	6.30	15.22	6.02	4.522	.011	c > a
SDQ-Teacher	10.72	6.81	13.23	7.50	12.47	7.48	8.168	<.001	b > a; c > a

Notes: Caregiver AUDIT = caregiver alcohol-use problems, reported as Alcohol Use Disorders Identification Test total scale score; Non-orphans = children whose biological parents are still living; Other-orphans = children who have had at least one parent die from causes unrelated to HIV/AIDS; AIDS-orphans = children who have had at least one parent die from AIDS-related causes; SDQ-Child = SDQ total scale score, child self-report; SDQ-Caregiver = SDQ total scale score, caregiver/parent report; SDQ-Teacher = SDQ total scale score, teacher report.
[a]Non-orphans.
[b]Other-orphans.
[c]AIDS-orphans.

Regarding SDQ-Teacher-reported total problems, the direct effect of caregiver alcohol-use problems ($\beta = .076$, SE = .037, $t = 2.035$, $p = .042$) was significant, while that of AIDS-orphan status ($\beta = .023$, SE = .037, $t = 0.628$, $p = .530$) was not significant. The interaction effect was not significant ($\beta = -.015$, SE = .035, $t = -0.428$, $p = .668$). The hypothesized model accounted for 0.6% of the total variance in SDQ-Teacher-reported total problems ($R^2 = .006$). See Table 3 and Figure 1 for all model results.

Comparisons of the model coefficients of males to those of females were made by creating critical ratios (Hopwood, 2007). The observed coefficients for each of the paths were not significantly different by gender (see Table 4).

Post hoc *analyses*

Two additional models were specified to test whether the interaction effect tested above was confounded by grouping other-orphans and non-orphans together. These models utilized the same path analyses as before, but changed only the orphan status contrast variable. In the first follow-up model, other-orphans (dummy code = 1; $n = 273$) were compared to AIDS-orphans and non-orphans (dummy code = 0; $n = 469$). The model fit statistics demonstrated good fit. Other-orphan status was significantly associated with SDQ-Teacher-reported total problems. Additionally, caregiver alcohol use was related to the SDQ-Teacher-report. None of the three interaction effects were significant (data available upon request).

In the second *post hoc* model, non-orphans (dummy code = 1; $n = 248$) were compared to AIDS-orphans and other-orphans (dummy code = 0; $n = 494$). The model fit statistics demonstrated good fit. Non-orphan status was significantly associated with SDQ-Caregiver- and SDQ-Teacher-reported problems. Caregiver alcohol use was related to SDQ-Teacher-reported problems. None of the three interactions effects were significant (data available upon request).

Discussion

The present study was the first in the developing world to examine the relation between caregiver alcohol-use problems and child mental health problems in the context of orphan status. While significant direct effects for caregiver alcohol use and child AIDS-orphan status were observed on child mental health problems, findings did not support the study's hypotheses concerning potential interactive effects between caregiver alcohol use and orphan status for any of the three reports of child mental health problems. These findings were consistent across males and females and did not change when AIDS-orphans, other-orphans, or non-orphans served as the comparison group. The significant direct effects observed were for AIDS-orphan status on caregiver-reported child mental health and caregiver alcohol-use

Table 3. Path analysis model with fit statistics ($N = 742$).

	SDQ-Child-self-report				SDQ-Caregiver report				SDQ-Teacher report			
AIDS-orphans vs. non-AIDS-orphaned children	β	SE	*t*	*p*	β	SE	*t*	*p*	β	SE	*t*	*p*
AIDS-orphan status	.017	.183	0.463	.644	.105	.222	2.873	.004	.023	.268	0.628	.530
Caregiver AUDIT	.010	.185	0.257	.797	.038	.225	1.036	.300	.075	.271	2.035	.042
Interaction	−.013	.174	−0.344	.731	−.019	.211	−0.514	.607	−.016	.255	−0.428	.668
	$R^2 = .001$				$R^2 = .013$				$R^2 = .006$			
Model fit statistics	CFI				GFI				RMSEA			
	.990				.999				.038 (.000–.113)			

Notes: Caregiver AUDIT = caregiver alcohol-use problems, reported as Alcohol Use Disorders Identification Test total scale score; AIDS-orphan status = AIDS-orphan or non-AIDS-orphan, coded as non-AIDS-orphan = 0 and AIDS-orphan = 1; SDQ-Child-self-report = SDQ total scale score, child self-report; SDQ-Caregiver report = SDQ total scale score, caregiver/parent report; SDQ-Teacher report = SDQ total scale score, teacher report; CFI, comparative fit index ; GFI, goodness-of-fit statistic; RMSEA, root mean square error of approximation.

Table 4. Comparison of the model coefficients for males and females ($N = 742$).

AIDS-orphan status		Males		Females		
Endogenous	Exogenous	β	p	β	p	z-Score
SDQ-Child	AIDS-orphan status	<0.001	.992	0.030	.563	0.419
SDQ-Child	Caregiver AUDIT	−0.038	.450	0.065	.251	1.361
SDQ-Child	Interaction	−0.027	.587	−0.011	.835	0.232
SDQ-Caregiver	AIDS-orphan status	0.083	.100	0.121	.023	0.525
SDQ-Caregiver	Caregiver AUDIT	0.023	.636	0.048	.402	0.330
SDQ-Caregiver	Interaction	−0.022	.644	−0.010	.842	0.172
SDQ-Teacher	AIDS-orphan status	0.006	.902	0.022	.657	0.220
SDQ-Teacher	Caregiver AUDIT	0.060	.235	0.081	.135	0.281
SDQ-Teacher	Interaction	0.002	.973	−0.016	.748	−0.247

Note: None of the z-scores reached significance.

problems on teacher-reported child mental health. *Post hoc* analyses also showed that being orphaned by causes unrelated to HIV/AIDS had a direct effect on teacher-reported child mental health. Thus, being orphaned and having a caregiver with greater levels of alcohol-use problems were independently related to an increased likelihood of child mental health problems.

Interestingly, the direct effects observed for other-orphan and AIDS-orphan status differed by the informant of the SDQ. AIDS-orphan status was associated with greater caregiver-reported child mental health problems, while other-orphan status related to greater teacher-reported child mental health problems. Differences in mental health reporting in children based on source are commonplace (De Los Reyes & Kazdin, 2005), and have also been reported for the SDQ (Kersten et al., 2016). This also highlights the importance of multiple informants in assessing child mental health (Goodman et al., 2003), with the idea being that different sources may have unique access to different types of information and symptoms. Moreover, no effects were observed on child self-reported mental health problems, which may reflect the differential ability of the self-report version of the SDQ to detect psychopathology relative to the caregiver- and teacher-report versions, particularly within the present study's young sample of 7–11-year-olds (Goodman, 2001).

The present findings extend previous research in both the developed world and the developing world showing the negative impact of parental death on child mental health (Cluver et al., 2007; Dowdney, 2000). However, in contrast to some previous work (Cluver et al., 2007), these results provided further evidence that AIDS-orphans and children orphaned by other causes in South Africa may not differ significantly in levels of mental health problems (Wild et al., 2013). Moreover, when occurring together, orphan status and caregiver alcohol-use problems did not exhibit a synergistic effect on child mental health. Other factors, such as trauma and stress specifically related to orphan status, may interact more intimately with orphan status than caregiver alcohol use (Cluver, Gardner, & Operario, 2008; Cluver et al., 2012; Nyamukapa et al., 2010). It is also possible that high levels of stress among caregivers of orphans may manifest in more ways than alcohol-use problems, such as depression and anxiety symptoms, which were not measured in the present study (Govender et al., 2012; Muliira & Muliira, 2011).

Results of the present study also extend previous research in the developed world (Eiden, Molnar, Colder, Edwards, & Leonard, 2009; Lindsey et al., 2008; Way & Urbaniak, 2008) by identifying caregiver alcohol use as a risk factor for mental health problems among children in the developing world. Alcohol-use rates are high in South Africa (WHO, 2014), with alcohol abuse among the three most prevalent mental health disorders in South Africa (Williams et al., 2008). Notably, the present study did not observe an interaction effect of caregiver alcohol use with child orphan status, despite the fact that the study was conducted in an area known for high alcohol and substance use (South African Department of Health, 2002). Instead, reports of alcohol-use problems among caregivers were generally low ($M = 3.53$) and fewer caregivers than expected (based on previous research in Southern Africa: Chinyadza et al., 1993; Myer et al., 2008; Young & Mayson, 2010) met criteria for alcohol-use problems (cut-score of 8 or greater; $n = 158$, 21.3%). There was also little variability across caregivers by orphan status, with caregivers of other-orphaned children reporting the lowest AUDIT scores. This was also unexpected given the level of stressors accompanying caring for orphaned children. Thus, one limitation of the present study may be that caregivers underreported alcohol use. For those caregivers entrusted with orphans by the South African government, knowledge of policy authorizing the removal of orphans (and corresponding government-sponsored orphan grants) from caregivers who abuse alcohol or other substances may have increased the likelihood of socially desirable responding. Therefore, the effects reported in the present study may underrepresent the actual impact of caregiver alcohol use on orphaned children. The present study highlights the difficulty of accurately assessing levels of alcohol and other substance use among caregivers of orphans in South Africa. Future work in this population may benefit from providing additional assurances of confidentiality prior to administering the survey on alcohol/substance use to decrease social desirability biases. Alternatively, audio computer-assisted self-interviewing has shown promise in Sub-Saharan Africa as a valid and feasible method of assessing stigmatized behaviors (Hewett, Erulkar, & Mensch, 2004; Mensch et al., 2011).

In addition to the likelihood of social desirability reporting bias, the above findings should be considered

in the context of several other study limitations. Data included in the present analyses were cross-sectional and cannot speak to the direction of causality. Longitudinal work examining the impact of orphan status and caregiver alcohol use on child mental health is needed to better understand the direction of influence among these factors. The low internal reliability of the SDQ-Child-self-report suggests that more work is needed to better understand how this measure performs among South African children. The use of alternative self-report measures of child mental health in future work may further clarify the validity of this study's hypothetical model. Only gender was examined as a control variable within the examined models; future work including more theoretically informed covariates would further test the strength of the present study's findings.

Despite these limitations, this study had several strengths. As the first to examine such effects among orphans in the developing world, this study lays a foundation for future work. The gender-balanced sample of 7–11-year olds, an understudied age group (Chi & Li, 2013; Cluver & Gardner, 2007a), contributes to the understanding of orphan mental health generally. Participants were recruited from hard-to-reach areas of the Free State Province of South Africa, representing an area with high rates of mental health problems among adults and children. Door-to-door sampling afforded access to this difficult population, and strict guidelines regarding confidentiality and participant illiteracy were followed to protect data quality. Moreover, child mental health was examined across three reporters to reduce the impact of report bias. Given these strengths, study findings provide preliminary evidence that targeting both caregiver alcohol use and addressing the cascading effects of orphan status independently may increase the effectiveness of interventions and public policy to reduce mental health among HIV-affected children in the developing world. Additional work is needed to examine the effects of other forms of caregiver mental health problems on orphan outcomes. In particular, studies designed to examine the reciprocal effects of caregiver and orphan mental health on one another in the context of high-stress environments (e.g., poverty and violence) may provide greater insight into the mechanisms underlying mental health problems among families impacted by the HIV/AIDS epidemic. In addition, research is necessary that addresses how best to intervene in families with parental substance-use problems, specifically in the developing world, where alcohol users appear more likely to use heavily than elsewhere (WHO, 2014) and where under-reporting of substance use problems (Hewett et al., 2004; Mensch et al., 2011) may pose additional barriers to intervention.

Acknowledgements

We wish to thank the children, their caregivers and teachers, and our community NGO and CBO partners, as well as the fieldworkers who helped to collect this data.

Funding

This study was funded by the National Institute of Mental Health (R01 MH078757; PI Sharp).

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Babor, T. F., de la Fuente, J. R., Saunders, J., & Grant, M. (1992). *AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for use in primary health care, revision* (WHO Document No. WHO/PSA/92.4). Geneva, Switzerland.

Billings, R. S., & Wroten, S. P. (1978). Use of path analysis in industrial/organizational psychology: Criticisms and suggestions. *Journal of Applied Psychology*, *63*(6), 677–688. doi:10.1037/0021-9010.63.6.677

Bourdon, K. H., Goodman, R., Rae, D. S., Simpson, G., & Koretz, D. S. (2005). The Strengths and Difficulties Questionnaire: U.S. normative data and psychometric properties. *Journal of the American Academy of Child & Adolescent Psychiatry*, *44*(6), 557–564. doi:10.1097/01.chi.0000159157.57075.c8

Brook, J. S., Morojele, N. K., Pahl, K., & Brook, D. W. (2006). Predictors of drug use among South African adolescents. *Journal of Adolescent Health*, *38*(1), 26–34. doi:10.1016/j.jadohealth.2004.08.004

Chi, P., & Li, X. (2013). Impact of parental HIV/AIDS on children's psychological well-being: A systematic review of global literature. *AIDS and Behavior*, *17*(7), 2554–2574.

Chinyadza, E., Moyo, I. M., Katsumbe, T. M., Chisvo, D., Mahari, M., Cock, D. E., & Mbengeranwa, O. L. (1993). Alcohol problems among patients attending five primary health care clinics in Harare city. *The Central African Journal Of Medicine*, *39*(2), 26–32.

Clausen, T., Romøren, T. I., Rossow, I., Ingstad, B., Molebatsi, R. M., & Holmboe-Ottesen, G. (2005). Patterns of alcohol consumption among older persons in Botswana. *Contemporary Drug Problems: An Interdisciplinary Quarterly*, *32*(2), 171–193.

Cluver, L., & Gardner, F. (2007a). The mental health of children orphaned by AIDS: A review of international and Southern African research. *Journal of Child and Adolescent Mental Health*, *19*(1), 1–17.

Cluver, L., & Gardner, F. (2007b). Risk and protective factors for psychological well-being of children orphaned by AIDS in Cape Town: A qualitative study of children and caregivers' perspectives. *AIDS Care*, *19*(3), 318–325. doi:10.1080/09540120600986578

Cluver, L., Gardner, F., & Operario, D. (2007). Psychological distress amongst AIDS-orphaned children in urban South

Africa. *Journal of Child Psychology and Psychiatry*, *48*(8), 755–763. doi:10.1111/j.1469-7610.2007.01757.x

Cluver, L., Gardner, F., & Operario, D. (2009). Poverty and psychological health among AIDS-orphaned children in Cape Town, South Africa. *AIDS Care*, *21*(6), 732–741. doi:10.1080/09540120802511885

Cluver, L., Operario, D., & Gardner, F. (2009). Parental illness, caregiving factors and psychological distress among children orphaned by acquired immune deficiency syndrome (AIDS) in South Africa. *Vulnerable Children And Youth Studies*, *4*(3), 185–198. doi:10.1080/17450120902730196

Cluver, L., Orkin, M., Boyes, M., Gardner, F., & Meinck, F. (2011). Transactional sex amongst AIDS-orphaned and AIDS-affected adolescents predicted by abuse and extreme poverty. *JAIDS: Journal of Acquired Immune Deficiency Syndromes*, *58*(3), 336–343.

Cluver, L., Orkin, M., Boyes, M. E., Sherr, L., Makasi, D., & Nikelo, J. (2013). Pathways from parental AIDS to child psychological, educational and sexual risk: Developing an empirically-based interactive theoretical model. *Social Science & Medicine*, *87*, 185–193. doi:10.1016/j.socscimed.2013.03.028

Cluver, L. D., Gardner, F., & Operario, D. (2008). Effects of stigma on the mental health of adolescents orphaned by AIDS. *Journal of Adolescent Health*, *42*(4), 410–417.

Cluver, L. D., Orkin, M., Gardner, F., & Boyes, M. E. (2012). Persisting mental health problems among AIDS-orphaned children in South Africa. *Journal of Child Psychology and Psychiatry*, *53*(4), 363–370. doi:10.1111/j.1469-7610.2011.02459.x

De Los Reyes, A., & Kazdin, A. E. (2005). Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin*, *131*(4), 483–509.

Doku, P. N. (2009). Parental HIV/AIDS status and death, and children's psychological wellbeing. *International Journal of Mental Health Systems*, *3*(26). doi:10.1186/1752-4458-3-26

Dowdney, L. (2000). Childhood bereavement following parental death. *Journal of Child Psychology and Psychiatry*, *41*(7), 819–830.

Eiden, R. D., Molnar, D. S., Colder, C., Edwards, E. P., & Leonard, K. E. (2009). A conceptual model predicting internalizing problems in middle childhood among children of alcoholic and nonalcoholic fathers: The role of marital aggression. *Journal of Studies on Alcohol and Drugs*, *70*(5), 741–750.

Ferreira-Borges, C., Dias, S., Babor, T., Esser, M. B., & Parry, C. D. H. (2015). Alcohol and public health in Africa: Can we prevent alcohol-related harm from increasing? *Addiction*, *110*(9), 1373–1379.

Ford, T., Hutchings, J., Bywater, T., Goodman, A., & Goodman, R. (2009). Strengths and Difficulties Questionnaire added values scores: Evaluating effectiveness in child mental health interventions. *The British Journal of Psychiatry*, *194*(6), 552–558.

Freisthler, B., & Gruenewald, P. J. (2013). Where the individual meets the ecological: A study of parent drinking patterns, alcohol outlets, and child physical abuse. *Alcoholism: Clinical and Experimental Research*, *37*(6), 993–1000. doi:10.1111/acer.12059

Gjersing, L., Caplehorn, J. R. M., & Clausen, T. (2010). Cross-cultural adaptation of research instruments: Language, setting, time and statistical considerations. *BMC Medical Research Methodology*, *10*, 323. doi:10.1186/1471-2288-10-13

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Child Psychology & Psychiatry & Allied Disciplines*, *38*(5), 581–586. doi:10.1111/j.1469-7610.1997.tb01545.x

Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry*, *40*(11), 1337–1345. doi:10.1097/00004583-200111000-00015

Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2003). Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *International Review of Psychiatry*, *15*(1-2), 166–172.

Govender, K., Penning, S., George, G., & Quinlan, T. (2012). Weighing up the burden of care on caregivers of orphan children: The Amajuba District Child Health and Wellbeing Project, South Africa. *AIDS Care*, *24*(6), 712–721. doi:10.1080/09540121.2011.630455

Hambleton, R. K. (2001). The next generation of the ITC test translation and adaptation guidelines. *European Journal of Psychological Assessment*, *17*(3), 164–172. doi:10.1027//1015-5759.17.3.164

Heise, D. R. (1975). *Causal analysis*. Oxford: John Wiley & Sons.

Hewett, P. C., Erulkar, A. S., & Mensch, B. S. (2004). The feasibility of computer-assisted survey interviewing in Africa: experience from two rural districts in Kenya. *Social Science Computer Review*, *22*(3), 319–334.

Hopwood, C. J. (2007). Moderation and mediation in structural equation modeling: Applications for early intervention research. *Journal of Early Intervention*, *29*(3), 262–272.

Hosegood, V., Vanneste, A.-M., & Timaeus, I. M. (2004). Levels and causes of adult mortality in rural South Africa: The impact of AIDS. *AIDS (London, England)*, *18*(4), 663–671.

Ice, G. H., Yogo, J., Heh, V., & Juma, E. (2010). The impact of caregiving on the health and well-being of Kenyan Luo grandparents. *Research on Aging*, *32*(1), 40–66. doi:10.1177/0164027509348128

Kahn, K., Tollman, S. M., Garenne, M., & Gear, J. S. (2000). Validation and application of verbal autopsies in a rural area of South Africa. *Tropical Medicine & International Health: TM & IH*, *5*(11), 824–831.

Kersten, P., Czuba, K., McPherson, K., Dudley, M., Elder, H., Tauroa, R., & Vandal, A. (2016). A systematic review of evidence for the psychometric properties of the Strengths and Difficulties Questionnaire. *International Journal of Behavioral Development*, *40*(1), 64–75.

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford Press.

Kranzler, E. M. (1990). Parental death in childhood. In L. E. Arnold (Ed.), *Childhood stress* (pp. 405–422). New York, NY: John Wiley & Sons.

Kuo, C., Cluver, L., Casale, M., & Lane, T. (2014). Cumulative effects of HIV illness and caring for children orphaned by AIDS on anxiety symptoms among adults caring for children in HIV-endemic South Africa. *AIDS Patient Care and STDs*, *28*(6), 318–326. doi:10.1089/apc.2013.0225

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: An International Journal for Research, Policy and Practice*, *7*(3), 253–269. doi:10.1080/17441692.2011.626436

Li, X., Barnett, D., Fang, X., Lin, X., Zhao, G., Zhao, J., … Stanton, B. (2009). Lifetime incidences of traumatic events and mental health among children affected by HIV/AIDS in rural China. *Journal of Clinical Child and Adolescent Psychology*, *38*(5), 731–744.

Lindsey, M. A., Browne, D. C., Thompson, R., Hawley, K. M., Graham, J. C., Weisbart, C., … Kotch, J. B. (2008). Caregiver mental health, neighborhood, and social network influences on mental health needs among African American children. *Social Work Research*, *32*(2), 79–88. doi:10.1093/swr/32.2.79

Madu, S. N. (2002). Perceived parental disorders as risk factors for child sexual, physical and emotional abuse among high school students in the Northern Province, South Africa. *IFE Psychologia: An International Journal*, *10*(1), 28–43. doi:10.4314/ifep.v10i1.23472

Marais, L., & Pelser, A. (2006). Voting with their feet: Post-apartheid population trends in the Free State. *South African Geographical Journal*, *88*(1), 19–28.

Mensch, B. S., Hewett, P. C., Abbott, S., Rankin, J., Littlefield, S., Ahmed, K., … Skoler-Karpoff, S. (2011). Assessing the reporting of adherence and sexual activity in a simulated microbicide trial in South Africa: An interview mode experiment using a placebo Gel. *AIDS and Behavior*, *15*(2), 407–421.

Morojele, N. K., & Brook, J. S. (2006). Substance use and multiple victimisation among adolescents in South Africa. *Addictive Behaviors*, *31*(7), 1163–1176. doi:10.1016/j.addbeh.2005.09.009

Muliira, R. S., & Muliira, J. K. (2011). Health-promoting practices and the factors associated with self-reported poor health in caregivers of children orphaned by AIDS in southwest Uganda. *African Journal of AIDS Research*, *10*(4), 479–486. doi:10.2989/16085906.2011.646663

Myer, L., Smit, J., Le Roux, L., Parker, S., Stein, D. J., & Seedat, S. (2008). Common mental disorders among HIV-infected individuals in South Africa: Prevalence, predictors, and validation of brief psychiatric rating scales. *AIDS Patient Care and STDs*, *22*(2), 147–158. doi:10.1089/apc.2007.0102

Nyamukapa, C. A., Gregson, S., Lopman, B., Saito, S., Watts, H. J., Monasch, R., … Jukes, M. C. H. (2008). HIV-associated orphanhood and children's psychosocial distress: Theoretical framework tested with data from Zimbabwe. *American Journal of Public Health*, *98*(1), 133–141.

Nyamukapa, C. A., Gregson, S., Wambe, M., Mushore, P., Lopman, B., Mupambireyi, Z., … Jukes, M. C. H. (2010). Causes and consequences of psychological distress among orphans in Eastern Zimbabwe. *AIDS Care*, *22*(8), 988–996.

Onuoha, F. N., Munakata, T., Serumaga-Zake, P. A. E., Nyonyintono, R. M., & Bogere, S. M. (2009). Negative mental health factors in children orphaned by AIDS: Natural mentoring as a palliative care. *AIDS and Behavior*, *13*(5), 980–988.

Paris, J., Zweig-Frank, H., & Guzder, J. (1994). Risk factors for borderline personality in male outpatients. *Journal of Nervous and Mental Disease*, *182*(7), 375–380.

Sharp, C., Croudace, T. J., Goodyer, I. M., & Amtmann, D. (2005). The strength and difficulties questionnaire: Predictive validity of parent and teacher ratings for help-seeking behaviour over one year. *Educational and Child Psychology*, *22*(3), 28–44.

Sharp, C., Venta, A., Marais, L., Skinner, D., Lenka, M., & Serekoane, J. (2014). First evaluation of a population-based screen to detect emotional-behavior disorders in orphaned children in sub-Saharan Africa. *AIDS and Behavior*, *18*(6), 1174–1185. doi:10.1007/s10461-014-0739-6

Shaw, C., Brady, L.-M., & Davey, C. (2011). *Guidelines for research with children and young people*. London: National Children's Bureau.

Sorsdahl, K., Stein, D. J., Williams, D. R., Anthony, J., & Myers, B. (2015). Childhood punishment and risk for alcohol use disorders: Data from South Africa. *International Journal of Mental Health and Addiction*, *13*(1), 103–114. doi:10.1007/s11469-014-9516-z

South African Department of Health. (2002). *South African demographic and health survey, 1998*. Retrieved from Pretoria, Republic of South Africa http://dhsprogram.com/pubs/pdf/FR131/FR131.pdf

Staton-Tindall, M., Sprang, G., Clark, J., Walker, R., & Craig, C. D. (2013). Caregiver substance use and child outcomes: A systematic review. *Journal of Social Work Practice in the Addictions*, *13*(1), 6–31. doi:10.1080/1533256X.2013.752272

Tu, X., Lv, Y., Li, X., Fang, X., Zhao, G., Lin, X., … Stanton, B. (2009). School performance and school behaviour of children affected by acquired immune deficiency syndrome (AIDS) in China. *Vulnerable Children and Youth Studies*, *4*(3), 199–209.

United Nations Children's Fund. (2013). *Towards an AIDS-Free Generation – Children and AIDS: Sixth Stocktaking Report*. New York

van de Vijver, F., & Hambleton, R. K. (1996). Translating tests: Some practical guidelines. *European Psychologist*, *1*(2), 89–99. doi:10.1027/1016-9040.1.2.89

Way, I., & Urbaniak, D. (2008). Delinquent histories of adolescents adjudicated for criminal sexual conduct. *Journal of Interpersonal Violence*, *23*(9), 1197–1212. doi:10.1177/0886260508314296

Weston, R., & Gore, P. A., Jr. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist*, *34*(5), 719–751. doi:10.1177/0011000006286345

Wild, L. G., Flisher, A. J., & Robertson, B. A. (2013). Risk and resilience in orphaned adolescents living in a community affected by AIDS. *Youth & Society*, *45*(1), 140–162.

Williams, D. R., Herman, A., Stein, D. J., Heeringa, S. G., Jackson, P. B., Moomal, H., & Kessler, R. C. (2008). Twelve-month mental disorders in South Africa: prevalence, service use and demographic correlates in the population-based South African stress and health study. *Psychological Medicine*, *38*(2), 211–220. doi:10.1017/S0033291707001420

World Health Organization. (2014). *Global status report on alcohol and health*. Geneva: WHO.

Young, C., & Mayson, T. (2010). The Alcohol Use Disorders Identification Scale (AUDIT) normative scores for a multiracial sample of Rhodes University residence students. *Journal of Child and Adolescent Mental Health*, *22*(1), 15–23. doi:10.2989/17280583.2010.493659

Zhao, G., Li, X., Fang, X., Zhao, J., Hong, Y., Lin, X., & Stanton, B. (2011). Functions and sources of perceived social support among children affected by HIV/AIDS in China. *AIDS Care*, *23*(6), 671–679.