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Child and Adolescent Suicide Attempts, Suicidal Behavior, and Adverse Childhood Experiences in South Africa: A Prospective Study

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A B S T R A C T

Purpose: This is the first known prospective study of child suicidal behavior in sub-Saharan Africa. Aims were to determine whether (1) cumulative exposure to adverse childhood experiences (ACEs) predicts later suicidality and (2) heightened risks are mediated by mental health disorder and drug/alcohol misuse.
Methods: Longitudinal repeated interviews were conducted 1 year apart (97% retention) with 3,515 adolescents aged 10–18 years in South Africa (56% female; <2.5% refusal). Random selection of census enumeration areas from urban/rural sites within two provinces and door-to-door sampling included all homes with a resident adolescent. Measures included past-month suicide attempts, planning, and ideation, mental health disorders, drug/alcohol use, and ACE, for example, parental death by AIDS or homicide, abuse, and exposure to community violence. Analyses included multivariate logistic regression and multiple mediation tests.
Results: Past-month suicidality rates were 3.2% of adolescents attempting, 5.8% planning, and 7.2% reporting ideation. After controlling for baseline suicidality and sociodemographics, a strong, graded relationship was shown between cumulative ACE and all suicide behaviors 1 year later. Baseline mental health, but not drug/alcohol misuse, mediated relationships between ACE and subsequent suicidality. Suicide attempts rose from 1.9% among adolescents with no ACE to 6.3% among adolescents with >5 ACEs (cumulative odds ratio [OR], 2.46; confidence interval [CI], 1.00–6.05); for suicide planning, from 2.4% to 12.5% (cumulative OR, 4.40; CI, 2.08–9.29); and for suicide ideation, from 4.2% to 15.6% (cumulative OR, 2.99; CI, 1.68–5.53).
Conclusions: Preventing and mitigating childhood adversities have the potential to reduce suicidality. Among adolescents already exposed to adversities, effective mental health services may buffer against future suicidality.

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IMPLICATIONS AND CONTRIBUTION

Sub-Saharan Africa has high rates of childhood exposure to adversities such as parental death, abuse, and violence. This prospective study tests linkages to suicide behavior, finding that severe childhood adversities increase mental health disorder, thereby increasing suicide attempts threefold and suicide planning fivefold.

Global suicide rates have risen by 60% in the past 50 years, although reliable data are lacking from sub-Saharan Africa [1]. In South Africa, suicide is responsible for around 9.5% of non-natural deaths among young people, with school-based studies reporting wide-ranging ideation rates of 4%–47% [2]. Suicidal ideation is often recurrent and associated with subsequent risk of suicide attempts; around one third of fatal suicides have made a prior suicide attempt [3]. All suicidal behaviors are burdensome and deserving of support.

Adolescents' suicidal behavior has been linked to an interplay between genetic, psychological, cognitive, and social factors, with particular risks related to childhood adversities [4]. In the 1990s, the ground breaking "Adverse Childhood Experiences" (ACEs) study in the United States showed strong and graded relationships between retrospective reports of exposure to childhood ACEs and suicide attempts during adolescence and adulthood [5]. Findings identified depression and substance misuse as possible mediators of this relationship.

Within sub-Saharan Africa, large numbers of youth are exposed to ACEs. These include experiences identified in developed world studies, such as abuse and domestic violence, and others more common to the region, such as parental AIDS-illness and death. Evidence suggests that many of these are closely and causally related to each other, and if left unchecked, can result in accumulated exposure to multiple adversities [6]. Although many children show remarkable resilience [7], cumulative exposure to stressors may wear down their coping capacity.

A small number of studies in sub-Saharan Africa have examined relationships between ACE and suicidality. Two studies used adult samples and tested associations between retrospective recall of abuse and of childhood traumas. In rural South Africa, women (n = 2,782) reporting childhood emotional neglect had increased likelihood of suicidal thoughts [8], and in Nigeria, childhood separation from biological parents, household conflict, and physical abuse were risk factors for lifetime suicide attempts (n = 6,752) [9]. Very few studies focus on youth suicide ideation (none assessing actual suicide attempts): children aged 13–15 years in schools in five African countries showed strong cross-sectional associations between exposure to physical and sexual violence and suicidal ideation [10], and in South Africa, increased suicidal ideation was found among children orphaned by AIDS or with AIDS-unwell parents [11].

To date, no known studies in sub-Saharan Africa have tested whether, as found in the United States, cumulative exposure to ACE is linked to child suicidality. Nor has any research in the region examined if heightened child suicide risks may be mediated, as suggested in the U.S. study, through mental health and substance misuse. Finally, to date all known studies either used cross-sectional data or adults' retrospective report of childhood adversities. Unlike initiatives in Europe and elsewhere, no known studies in sub-Saharan Africa have examined prospective predictors of child suicidality.

For this study, the adverse experiences identified in the United States were adapted to include adversities that are widespread within sub-Saharan Africa and shown to negatively affect child mental health. Thus, the following four ACE from the original U.S. study were used: physical, emotional and sexual abuse, and domestic violence exposure. Five additional ACEs that were particularly relevant to this context were added: AIDS-orphanhood, parental AIDS-illness, parental death by homicide, community violence exposure, and food insecurity. Study aims were to (1) test potential effects of cumulative ACE on subsequent child suicidal behavior and (2) test potential mediation effects of mental health and substance misuse.

Methods

Design

Participants and procedures. The baseline sample included 3,515 children and adolescents aged 10–18 years (56% female), interviewed at baseline (2009–2010; refusal rate <2.5%) and followed up at 1 year (2011–2012; retention rate, 96.8%). Two urban and two rural health districts with >30% antenatal HIV-prevalence were selected within two South African provinces: Mpumalanga and the Western Cape. Within these strata, sequentially numbered census enumeration areas were sampled using random number generation. In each area, every household was visited and included in the study if it had a resident adolescent. One randomly selected adolescent per household was interviewed face-to-face for 60–70 minutes. All questionnaires, information, and consent forms were translated into Xhosa, Zulu, Sotho, Swati, and Shangaan (and checked with back-translation), and adolescents chose their language of participation.

Ethical protocols were approved by the Universities of Oxford, Cape Town, and KwaZulu-Natal, and Provincial Health and Education Departments of Western Cape and Mpumalanga. All interviewers were trained in working with vulnerable youth, and voluntary informed consent was obtained from adolescents and primary caregivers. No incentives were given, apart from refreshments and certificates of participation. Confidentiality was maintained, except where participants were at risk of significant harm or requested assistance. Where participants reported recent abuse, rape, suicidal behavior, or risk of significant harm, immediate referrals were made to child protection and health services, with follow-up support including transport assistance for children to access services and identification of NGOs that could provide longer term support. For past abuse or rape, referrals and support in accessing HIV/AIDS and counseling services were provided. Throughout the study, approximately 600 referrals were made (including for nonreceipt of social welfare grants etc.), but in many contexts, services were understaffed and overburdened, and thus adolescents did not receive adequate long-term support.

Measures

Outcome. Suicidal behavior was measured with the MINI International Psychiatric Interview for children and adolescents suicidality scale [12], measuring self-harming desire, suicidal thoughts, ideation, planning, and attempts. This scale is well validated, showing strong internal consistency and test–retest reliability [13] with an acceptable alpha of .73 in the current sample.

Predictors. Adverse childhood experiences such as parental AIDS-death and AIDS-illness were determined using verbal autopsy methods [14], validated in South Africa with sensitivity of 89% and specificity 93% [15]. In the present study, determination of HIV/AIDS required reported HIV+ status with CD4 count <350, or a conservative threshold of ≥3 AIDS-defining illnesses; for example, Kaposi's sarcoma or shingles. Orphanhood used UNICEF definitions of loss of one or both parents. Parental death by homicide used qualitative child report alongside a checklist of causes of mortality. Abuse was measured using UNICEF scales for sub-Saharan Africa [16]. "Severe emotional abuse" used a conservative cutoff of weekly/more frequent exposure to verbal abuse, threats of eviction, or invoking evil spirits against children. "Severe physical abuse" used a conservative cutoff of weekly/more frequent beating with an object or deliberate harm. Contact sexual abuse was rape or unwanted contact with "private parts" of the adolescent or abusing adult.

Domestic violence used past-week frequency of adults hitting each other in the home. Community violence exposure used the Child Exposure to Community Violence Checklist [17], adapted to the four most common community traumas for children in South Africa [18], coded as victimization by any of the following: assault, robbery, and witnessing of stabbings and shootings. Food insecurity was measured using items from the National Food Consumption Survey [19] and determined as insufficient food for >2 days in the past week.

Sociodemographic factors. Sociodemographic factors included urban/rural location, child gender, age, province, and formal/informal home. Household socioeconomic status was measured using an index of access to the eight highest socially perceived childhood necessities, corroborated by >80% of the population in the nationally representative South African Social Attitudes Survey (school fees, school uniform, school books, a visit to the doctor and medicine when ill, clothes to keep warm and dry, two pairs of shoes, three meals a day, toiletries to be able to wash every day) [20] (see Table 1).

Potential mediators. Depression (past 2 weeks) was measured with the Child Depression Inventory Short Form, which highly correlated with the full scale ($r = .89$) [21]. Reliability in the current sample was $\alpha = .73$. Anxiety (past 2 weeks) used the Revised Children's Manifest Anxiety Scale [22], validated for use in South Africa [23], with the 14 highest loading items identified through factor analysis in a previous study [11] (current sample, $\alpha = .84$). Post-traumatic stress (past month) was measured using the Child PTSD Checklist [24], validated in South Africa [25] (current sample, $\alpha = .94$). Because of differing item numbers, scores were standardized and summed into a single scale. Alcohol and drug misuse were measured using 15 items adapted from the "National Survey of HIV and Risk Behavior amongst Young South Africans" [26]. This measured past-month regularity of alcohol use, coded as misuse if daily/several times a week, and past-year use of any drug, such as marijuana, mandrax, or crystal methamphetamine. Alcohol and drug use scores were standardized and summed into a single scale.

Analyses

First, youth lost and retained at follow-up assessment were compared on baseline sociodemographic characteristics and mental health and suicide-related variables. Second, frequency distributions for suicidal behavior, ACE, and potential mediators were checked. Third, categorical principal components analysis established that all predictors loaded onto a first component

(eigenvalue $= 1.8$). Loadings for physical, emotional abuse, domestic violence, food insecurity, and parental AIDS-illness were >.4; sexual abuse and community violence were >.25; and parental death was >.15. This first component accounted for 19.5% of the total variance. A second component had an eigenvalue >1 (1.1, 12.5% variance), but merely set up a contrast between a subgroup of three variables [27], and therefore only the first component was used for describing ACE [28]. The choice of the numerical analysis level provided equidistance between categories in the quantification [29]. A summative index with variables weighted by the component loadings correlated very closely with a simple summation of the dichotomies (Spearman's rho, .95; $p < .001$), so the latter was adopted for ease of interpretation [30]. Because of low prevalence of >5 ACE, scores 6–9 were combined (ACE > 5). Fourth, multivariate hierarchical logistic regression models were conducted to examine associations between ACE scores and subsequent suicidal behavior. Model 0 presents unadjusted coefficients. Model 1 adjusts for sociodemographic cofactors (child age, gender, province, urban/rural location, formal/informal home, socioeconomic status). Model 2 additionally adjusts for baseline suicidal behavior to determine whether ACE score predicted suicidal behavior over and above prior suicidality. Cumulative odds ratios (ORs) were calculated [31], and cross-tabulations indicated percentage proportions in respective groups. Fifth, to investigate potential mediating effects of mental health and substance use, a multiple mediation model was tested, using the PROCESS procedure developed by Preacher and Hayes [32]. Indirect effects and bias-corrected 95% CIs were estimated using 1,000 bootstrap samples [33] and following Hayes, unstandardized coefficients are reported. As an additional check, significant indirect effects were also subsequently confirmed using Sobel tests. Missing data were <1%, and so imputation was not conducted.

Results

At follow-up, 3% of adolescents were lost to follow-up, of which six had died (by homicide or illness, none to suicide). Youth lost to follow-up did not differ with regard to gender ($\chi^2(1) = .07$; $p = .789$), suicidal ideation ($\chi^2(1) = 2.20$; $p = .138$), suicide planning ($\chi^2(1) = 2.01$, $p = .156$), or anxiety scores ($F(1, 3,512) = 2.25$; $p = .134$) at baseline assessment. However, adolescents lost to follow-up were missing more basic necessities ($F(1, 3,514) = 21.55$; $p < .001$), older ($F(1, 3,512) = 6.44$; $p = .011$), had higher depression scores ($F(1, 3,512) = 8.98$; $p = .003$), and were more likely to have attempted suicide ($\chi^2(1) = 4.75$; $p = .029$) at baseline assessment. Although a follow-up rate of 96.70% after 1 year is extremely high, some of the most vulnerable participants were among the few unable to be traced and results should be interpreted with this in mind. The sample was limited to youth assessed at both time points for all further analyses.

Rates of suicidality (Table 2) were 2.2% of boys and 4.1% of girls reporting past-month suicide attempts, 3.0% of boys and 6.3% of girls reporting past-month suicide planning, and 5.6% of boys and 8.5% of girls reporting past-month suicide ideation. Of children reporting suicide ideation, 34% had attempted suicide in the past month, and of children reporting suicide planning, 43% had attempted suicide in the past month. Rates of baseline ACE exposure were comparable to other South African community samples. For example, 13% of adolescents were orphaned by AIDS

Table 1
Sample characteristics at baseline and follow-up

	Baseline	Follow-up
	N = 3,515	N = 3,401
Sex (female), n (%)	1,992 (56.7)	1,919 (54.6)
Western Cape, n (%)	1,851 (52.7)	1,753 (49.9)
Mpumalanga, n (%)	1,664 (47.3)	1,648 (46.9)
Live in urban area, n (%)	1,778 (50.6)	1,709 (48.6)
Live in rural area, n (%)	1,737 (49.4)	1,692 (48.1)
Mean age (standard deviation)	13.45 (2.149)	14.671 (2.219)
Mean number of basic necessities lacking (standard deviation)	2.716 (2.322)	2.9326 (2.493)

Table 2
Past-month suicidal ideation and behavior, and prevalence of adverse childhood experiences (ACE), mental health disorders and drug/alcohol misuse, by gender (percentages in parentheses)

	Male (n = 1,475) %	Female (n = 1,926) %
Suicide variables at follow-up		
Past-month suicide attempts	2.2	4.1
Past-month suicide planning	3.0	6.3
Past-month suicide ideation	5.6	8.5
Suicide variables at baseline	(n = 1,523)	(n = 1,992)
Past-month suicide attempts	1.9	4.5
Past-month suicide planning	3.0	6.6
Past-month suicide ideation	4.5	9.0
ACE variables at baseline		
Orphanhood by AIDS	12.5	13.6
Orphanhood by homicide	4.4	4.3
Parental AIDS-illness	28.1	33.5
Severe physical abuse	12.1	14.4
Severe emotional abuse	9.3	12.1
Sexual abuse or rape	2.5	5.8
Domestic violence	5.4	6.3
Community violence	49.3	43.1
Food insecurity	28.8	25.5
Distribution of ACE at baseline		
0	24.3	22.6
1–2	58.2	55.6
3–4	14.5	18.4
5–8	3.1	3.8
Hypothesized mediators at baseline		
Above cutoff for depression	4.5	7.3
Above cutoff for anxiety	7.5	11.5
Above cutoff for post-traumatic stress	21.7	27.6
Any drug or alcohol misuse	25.9	24.9

and 4.4% orphaned by homicide, 13% reported severe physical abuse, and 24% went hungry for >2 days in the past week.

Associations of adverse childhood experiences on subsequent suicide attempts

Logistic regression models (Table 3) showed that before any adjustments, baseline ACE score strongly predicted suicide attempts 1 year later (Model 0: OR, 1.25; confidence interval [CI], 1.10–1.42; $p < .001$). ACE score remained a significant predictor after controlling for sociodemographic cofactors (Model 1: OR, 1.24; CI, 1.08–1.44; $p = .003$). Importantly, this relationship was maintained when additionally controlling for baseline suicide attempts (Model 2: OR, 1.16; CI, 1.00–1.35; $p = .047$). After controlling for baseline suicide attempts and sociodemographics, the cumulative OR (i.e., comparing 0 ACE to >5 ACE) prospectively predicting suicide attempts was 2.46 (CI, 1.00–6.05). Cross-tabulated observed scores showed a strongly graded relationship between baseline cumulative ACE and follow-up suicide attempts, with rates of past-month suicide attempts rising from 1.9% with none of the identified ACE, to 6.3% with more than five.

Associations of adverse childhood experiences on subsequent suicide planning

Logistic regression models (Table 3) showed that ACE score strongly predicted suicide planning 1 year later, after controlling for sociodemographic cofactors and baseline suicide planning (Model 0: OR, 1.33; CI, 1.20–1.47; $p < .001$; Model 1: OR, 1.35; CI, 1.20–1.52; $p < .001$; Model 2: OR, 1.28; CI, 1.13–1.45; $p < .001$).

Table 3
Logistic regression models, first controlling for sociodemographics, next controlling for suicidality at baseline, for suicide attempts, planning, and ideation

	Suicide attempt (past month)			Suicide planning (past month)			Suicide ideation (past month)		
	Unadjusted OR (CI)	Model 1 OR (CI)	Model 2 OR (CI)	Unadjusted OR (CI)	Model 1 OR	Model 2 OR	Unadjusted OR (CI)	Model 1 OR	Model 2 OR
ACE score	1.25*** (1.10–1.42)	1.24** (1.08–1.44)	1.16* (1.00–1.35)	1.33*** (1.20–1.47)	1.35*** (1.20–1.52)	1.28*** (1.13–1.45)	1.26*** (1.15–1.38)	1.25*** (1.13–1.38)	1.20*** (1.09–1.33)
Age	—	1.22*** (1.11–1.34)	1.17* (1.11–1.34)	—	1.23*** (1.14–1.33)	1.19*** (1.10–1.29)	—	1.19*** (1.12–1.27)	1.16*** (1.09–1.24)
Female gender	—	1.87*** (1.23–2.85)	1.62* (1.05–2.48)	—	2.15*** (1.50–3.07)	1.97* (1.37–2.83)	—	1.51* (1.15–1.99)	1.39* (1.05–1.83)
Rural	—	.858 (.580–1.37)	.866 (.58–1.29)	—	.537** (.384–.750)	.536* (.382–.752)	—	.713* (.544–.934)	.714* (.544–.939)
Province	—	1.48 (.898–2.43)	1.53 (.92–1.1)	—	1.56* (1.04–2.35)	1.54* (1.02–2.33)	—	1.09 (1.04–2.35)	1.09 (.799–1.53)
Informal housing	—	.882 (.516–1.51)	.959 (.554–1.66)	—	.682 (.434–1.07)	.770 (.488–1.22)	—	.781 (.550–1.11)	.833 (.584–1.19)
Higher socioeconomic status	—	.991 (.902–1.09)	1.00 (.912–1.11)	—	.969 (.897–1.05)	.978 (.904–1.06)	—	.986 (.925–1.05)	.996 (.934–1.06)
Suicide attempt (baseline)	—	—	8.10*** (4.81–12.66)	—	—	3.64*** (2.33–5.70)	—	—	3.23*** (2.26–4.62)
Δχ²	10.63***	4.73***	6.08***	25.99***	10.37***	3.48***	24.49***	10.38***	11.55***

All predictors are shown at baseline; outcomes of suicide attempts and suicide planning are at follow-up.
Model 1 includes baseline ACE score. Model 2 additionally includes child age, gender, urban/rural location, province, formal/informal housing, and socioeconomic status. Model 3 additionally includes suicidal behavior at baseline. Range of ACE score was 0–8, and mean ACE score was 1.5.
ACE = adverse childhood experiences; OD = odds ratio; CI = confidence interval.
*$p < .05$; **$p < .01$; ***$p < .001$.

After controlling for baseline suicide planning and sociodemographics, the cumulative OR prospectively predicting suicide planning was 4.40 (CI, 2.08–9.29). Cross-tabulated observed scores showed a strongly graded relationship between baseline cumulative ACE and follow-up suicide planning with rates of past-month suicide planning rising from 2.4% among children with no identified ACE to 12.5% among those with more than five.

Associations of adverse childhood experiences on subsequent suicide ideation

Logistic regression models (Table 3) showed that baseline ACE score strongly predicted suicide ideation 1 year later, after controlling for sociodemographic cofactors and additionally controlling for baseline suicide ideation (Model 0: OR, 1.26; CI, 1.15–1.38; $p < .001$; Model 1: OR, 1.25; CI, 1.13–1.38; $p < .001$; Model 2: OR, 1.20; CI, 1.09–1.33; $p < .001$). After controlling for baseline suicide ideation and sociodemographics, the cumulative OR prospectively predicting suicide ideation was 2.99 (CI, 1.68–5.53). Cross-tabulated observed scores showed a strongly graded relationship between baseline cumulative ACE and follow-up suicide ideation, with rates of past-month suicide ideation rising from 4.2% among children with no identified ACE, to 15.6% among those with more than five.

Hypothesized mediators

(Figure 1) There was a significant indirect effect of ACE on all subsequent suicide behaviors via mental health (suicide attempts: $B = .112$; CI, .052–.174; $z = 3.792$; $p < .001$; suicide planning: $B = .087$; CI, .033–.139; $z = 3.580$; $p < .001$; suicide ideation: $B = .124$; CI, .087–.167; $z = 5.963$; $p < .001$). There were no associations between drug/alcohol misuse and suicide behaviors, and this did not mediate the relationship between ACE and any suicide behaviors (suicide attempts: $B = .009$; CI, .009–.025; $z = 1.165$; $p < .244$; suicide planning: $B = .009$; CI, .005–.022; $z = 1.406$; $p = .16$; suicide ideation: $B = .007$; CI, .003–.018; $z = 1.310$; $p = .190$). In addition, there was a direct effect of ACE on suicide planning ($B = .158$; standard error [SE] = .067; $p = .019$), but not on suicide attempts ($B = .042$; SE = .081; $p = .605$) or ideation ($B = .056$; SE = .056; $p = .320$). The total effect of ACE on suicide attempts was $B = .162$, on suicide planning was $B = .254$, and on suicide ideation was $B = .187$. Cross-tabulation was used to illustrate effects: rates of any suicidal behavior for adolescents with no ACE and no mental health disorder were 4.5% (5.7% for boys and 4.1% for girls), and with >5 ACE and a mental health disorder were 25.0% (22.2% for boys and 27.3% for girls).

Discussion

This is the first known large-scale, prospective study of childhood suicidal behavior in sub-Saharan Africa. Findings echo the U.S. ACE study, where cumulative exposure to adversities predicted childhood and adult suicide attempts, but with the following three valuable additions: (1) prospective longitudinal design, allowing assessment of direction of association; (2) corresponding control for baseline suicidality, giving ORs that are adjusted downward for a key behavioral predictor; and (3) demonstration that mental health mediates the relationship between ACE and suicidal behavior [34]. This sub-Saharan African sample suggested higher rates of suicidal behavior than in the U.S. ACE study; 3.2% of children reported past-month

suicide attempts, compared with 3.8% reporting lifetime suicide attempts in the U.S. sample. Both studies, as also demonstrated internationally, found higher rates of suicidality among females, but international evidence suggests more completed suicides among males, with South African hospital data showing a 3:1 female-to-male ratio for nonfatal suicide attempts, but a 5:1 male-to-female ratio for fatal suicides [2]. These suggest that, although there were very few gender differences in exposure to ACE, these may impact adolescent suicidality in different ways.

It is important to note that the vast majority of children in this South African sample, even those experiencing multiple concurrent adverse experiences, were not suicidal, and no fatal suicide attempts were found over the year follow-up. However, for the minority who report suicidal behavior, it is essential to identify and interrupt pathways of risk. These findings suggest the following four important foci of interventions: (1) preventing exposure to cumulative adversities; (2) promoting resilience among those who have already experienced adversities; (3) targeting interventions for children or adolescents who are experiencing mental health problems or suicidal behavior; and (4) identifying adolescents at potential risk.

Preventing exposure to adversities

Findings show a strong, graded relationship between cumulative ACE exposure and subsequent suicidality, even when controlling for prior suicidality. This suggests that interventions that reduce or mitigate the effects of social, familial, and HIV-related adversities may be protective against childhood suicide behavior. Fortunately, a strong intervention evidence base exists for many identified ACE, for example, the effectiveness of anti-retroviral treatment in reducing AIDS-related morbidity and mortality, and of regular cash transfers for reducing household food insecurity [35]. For other identified ACE, there is an emerging evidence base in developing world contexts, for example, a number of new studies are testing effectiveness of parenting support programmes to reduce abusive parenting [36]. To date, all these evidence-based interventions face major challenges in resourcing and scale-up, but the high rates of ACE such as hunger and parental AIDS-illness suggest the need for urgent intervention at scale.

Promoting resilience among adversity-exposed children

For those who have already experienced multiple adversities, it is essential to identify and promote modifiable predictors of resilience. Developed world suicide research with adults experiencing abuse, violence and HIV/AIDS-related trauma suggests protective effects of family social support and HIV-status disclosure [37]. Studies with AIDS-affected and abused children suggest resilience promotion through parental monitoring, disclosure, social support, and family-based interventions [38]. Further research is required to identify protective factors against childhood suicidality within sub-Saharan Africa.

Mental health and suicide prevention services

Findings also showed that the relationship between ACE and later suicidal behavior was mediated by internalizing mental health problems. It is well established that most completed suicides have experienced depression, anxiety, or post-traumatic symptoms, and many have reported previous suicidal ideation or
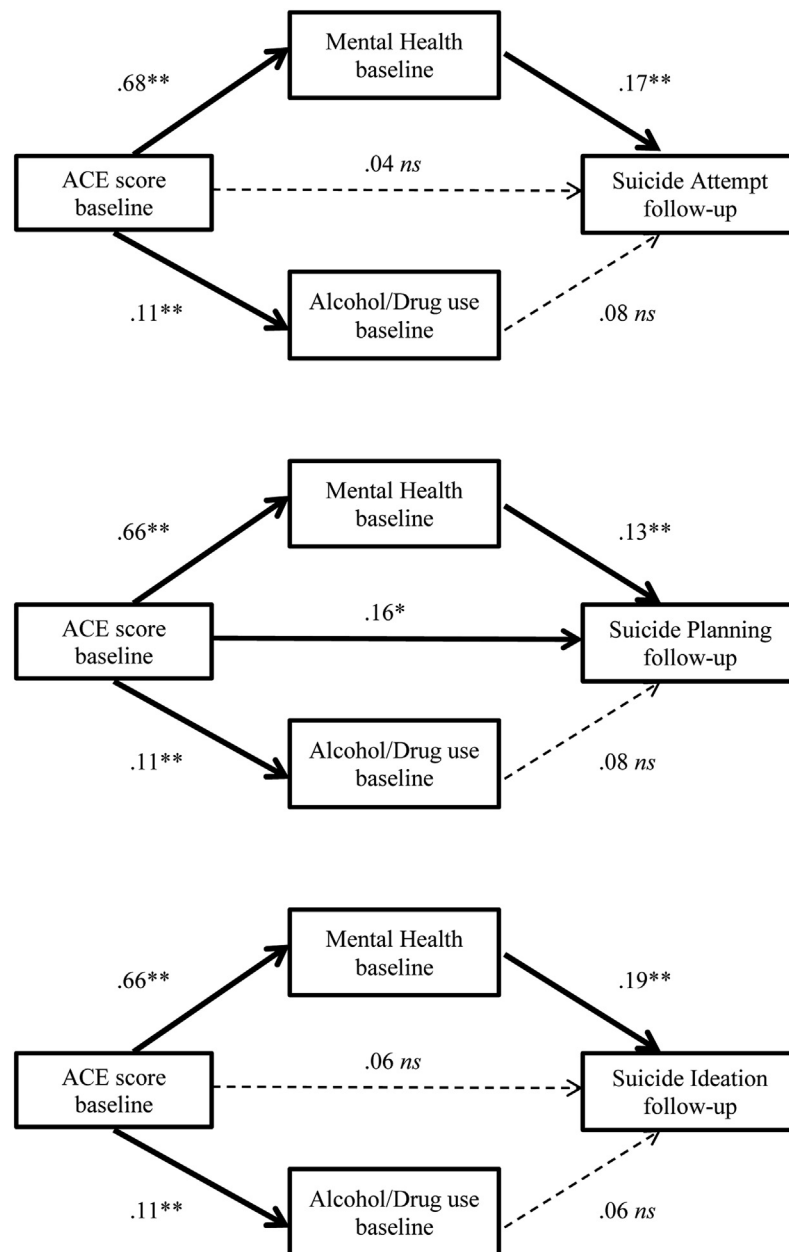
Figure 1. Mediation effects of mental health disorder on the relationship between baseline ACE score and suicidal behavior at follow-up. All regression weights are unstandardized. Analysis controls for child age and gender, suicide behavior at baseline, poverty, living in informal versus formal housing, urban versus rural location, and province (all measured at baseline). *p < .05; **p < .001.

behavior [39]. This has clear implications for mental health policy, suggesting the importance of screening for mental health problems and suicidality among adversity-exposed children. Furthermore, accessible and effective child and adolescent mental health and suicide prevention services may be essential components in reducing youth suicidality in sub-Saharan Africa [2,40].

Identifying adolescents at risk

These findings may also be of use in identifying adolescents who may be at risk of suicide attempt to practitioners in school, health, and social services and non-governmental organization settings. A quarter of adolescents with >5 ACE and a mental health disorder also reported suicidal behavior. When young people present with multiple adverse home circumstances, it could be valuable to screen for possible associated internalizing mental health problems, and if these are present to ask about suicidal ideation and behavior. For those adolescents who report past suicidal attempt, the findings of this article suggest that likelihood of future attempts is greatly increased.

This study has a number of limitations. First, the randomly selected communities did not include any prisons, children's

institutions, or psychiatric hospitals, and further research should examine risk and protective factors in these high-risk settings. Second, all health districts were high HIV-prevalence and thus, low-income areas in the South African context. Therefore, generalizability is not known to low HIV-prevalence or high-income population groups. However, the study benefited from within-sample variation, including urban and rural sites in two provinces and five language groups. Additionally, door-to-door household sampling ensured inclusion of non–school-attending children, who are particularly vulnerable to ACE. Third, there are no validated cutoffs for psychological disorder using standardized scales in South Africa, and the use of Western norms should be interpreted with caution. Fourth, although this is the first known sub-Saharan African study to collect prospective data on predictors of childhood suicide, the longitudinal sample is limited to 1 year. There would be great value in longer term prospective studies of suicidal behavior, ideally following children and adolescents into adulthood. In addition, future research should examine particular age groups when children and adolescents exposed to adversities are at highest risk of suicidal behavior, as well as potential influences of recency and chronicity of adverse experiences. Finally, further research is needed to understand the processes by which familial HIV/AIDS may cause or worsen other ACE, and potential differing effects of AIDS-orphanhood, living with AIDS-unwell family members, and being HIV-infected.

Despite these limitations, this study provides compelling evidence to inform suicide prevention approaches for children and adolescents in sub-Saharan Africa. Interventions with potential to reduce child suicidality include those improving family functioning, reducing poverty, mitigating the impacts of HIV/AIDS and the provision of effective mental health services for adversity-exposed children.

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Funding Sources

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