1   Running head: Parental bereavement in young children and resilience

2   Parental Bereavement in Young Children Living in South Africa and Malawi: Understanding

3   Mental Health Resilience

4   Target journals**:** JAIDS

5

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39   **Abstract**

40   **Background:** Parental loss is a major stressful event found to increase risk of mental health

41   problems in childhood. Yet, some children show resilient adaptation in the face of adversity

42   across time.

43   **Setting:** This study explores predictors of mental health resilience among parentally bereaved

44   children in South Africa and Malawi, and their cumulative effect. The study also explores

45   whether predictors of resilience differed between orphaned and non-orphaned children.

46   **Methods:** Consecutive attenders of community based organisations (children;4-13 years, and

47   their caregivers) were interviewed at baseline and 15-18 month follow up (n=833). Interviews

48   comprised of inventories on demographic information, family data, child mental health,

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49 bereavement experience and community characteristics. Mental health screens were used to

50 operationalise resilience as the absence of symptoms of depression, suicidality, trauma,

51 emotional and behavioural problems.

52 **Results:** Almost 60% of children experienced parental loss. One quarter of orphaned children

53 showed no mental health problems at either wave and were classified as resilient. There were

54 equal proportions of children classified as resilient within the orphaned (25%) vs. non-

55 orphaned group (22%). Being a quick learner, aiding ill family members, positive

56 caregiving, household employment, higher community support, and lower exposure to

57 domestic violence, physical punishment, or stigma at baseline predicted sustained resilience.

58 There were cumulative influences of resilience predictors among orphaned children.

59 Predictors of resilience did not vary by child age, gender, country of residence or between

60 orphaned and non-orphaned children.

61 **Conclusion:** This study enhances understanding of resilience in younger children and

62 identifies a number of potential environmental and psychosocial factors for bolstering

63 resilience in orphaned children.

64

65 Keywords: Parental bereavement; HIV; children; SSA; Mental Health; Resilience

66 **Introduction**

67 Parental loss is a dramatic life event for children with long term ramifications [1]. The AIDS

68 epidemic has contributed to the burden of parental loss for children. The advent of

69 antiretroviral treatment holds the promise of averting many negative trajectories for children

70 in such families. In the first instance, treatment will reduce parental death and can contribute

71 to healthy living so that unemployment, hospitalisation and interrupted caregiving may be

72   obviated. Yet, burdens associated with stigma, disclosure and relationship disruption may

73   still persist. Successful identification and treatment of HIV in pregnancy holds promise for

74   reducing - if not eliminating infant infections.   However, even though these positive

75   developments may minimize the impact, a residual burden of the epidemic remains, and

76   many children still face an existence with the effects of orphanhood as a legacy of the AIDS

77   epidemic.

78   Mental health problems have long been associated with orphanhood, generally [2] and AIDS

79   associated orphanhood specifically [3;4]. Elevated levels of depression, anxiety and trauma have

80   been identified in many HIV affected children [5]. These burdens are distressing in their own

81   right, but also contribute to negative outcomes in terms of risk behavior, school dropout and

82   behavioural problems [6;7]. Mental health problems are however not inevitable.[8] Community

83   care[9], bereavement[10] and general support[11], cash transfer[12], and social protection[13] generally

84   have all been shown to be effective in combatting such burdens.[14] An emerging body of

85   literature regarding resilience[15] explores the capacity of children to cope with negative life

86   events in the face of the negative effects of toxic stress which results when there is strong,

87   frequent or prolonged stress exposure.[16] There is a general debate around adverse child

88   experiences and their cumulative effect on outcome, with questions about severity, number

89   and type of adverse events, and whether all children exposed to the same events have the

90   same adverse outcomes.[17] Children facing mental health problems [18], or wide ranging trauma

91   such as conflict [19], are often able to cope, adapt and thrive.

92   A recent study of adolescents who were parentally bereaved [20] operationalised resilience as

93   consistent positive mental health at two time points. In this study, there were five predictors

94   of sustained resilience – namely better physical health, better caregiving quality, food

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95   security, better relationships with peers, reduced violence (community, stigma and bullying).

96   Although these findings hold true for adolescents, the situation may differ for younger

97   children. Interventions in the early childhood period have been shown to be of life long

98   significance [21] and may also support resilience and adaptation.

99   A recent systematic review indicated that there was evidence that a number of interventions

100   were effective in preventing children experiencing traumatic grief or various mental health

101   problems after bereavement.[22]   However, none were conducted in Africa.   Given this

102   literature, it would be important to examine predictors of resilience in young children facing

103   potential traumatic experiences. The objective of this study was to explore predictors of

104   mental health resilience amongst parentally bereaved children drawn from a community

105   sample of children aged 4-13 thus providing unique insight into the younger age groups and

106   exploring similarities with findings from adolescents.

107

108   **Method**

109   *Participants and Procedure*

110   Participants were drawn from consecutive attenders at a broad range of community based

111   organisations (CBOs) in South Africa and Malawi. The sample included 989 children aged

112   4-13 and primary caregivers interviewed at baseline (2011-2012) and followed-up 12-18

113   months later (2013-2014). There were 27 caregivers who were interviewed for more than one

114   of their children, resulting in a final sample size of 952 caregivers. At follow-up, 854 children

115   and their primary caregivers participated in the study (86.4% retention rate). All CBOs in

116   receipt of funding from 11 major funding partners were listed (n=558) and 28 were selected

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117 at random for inclusion. Participants were invited to complete baseline and follow up

118 interviews, collecting detailed information from both the child and the primary caregiver.

119 The consent rate was high (99.3%). 833 participants had complete data at both waves (84.2%

120 of the original sample), including 490 orphaned children (58.8%) and 343 non-orphaned

121 children (41.2%). Children who were lost to follow-up and those who were followed did not

122 differ by orphan status ($X^2(1)=2.32$, $p=0.13$) or mental health resilience at baseline

123 ($X^2(1)=0.65$, $p=0.43$). Children who were lost to follow-up were more likely to live in South

124 Africa ($X^2(1)=10.42$, $p=0.001$), and in poorer conditions (i.e., informal housing)

125 ($X^2(1)=12.61$, $p<0.001$), but were more often food insecure ($X^2(1)=4.65$, $p=0.03$).

126 Participation did not differ by other characteristics, including child variables (e.g., gender,

127 age, HIV status, school attendance), family variables (e.g., experience of domestic violence,

128 harsh discipline practices) and community variables (e.g., stigma, violence and social

129 support).

130

131 Ethical approval for the study was granted by University College London (1478/002) and

132 Stellenbosch University (N10/04/112) plus in country ethical approvals from lead

133 organizations. Written informed consent was obtained from caregivers for both themselves

134 and their child. Age appropriate information was provided to children and verbal assent for

135 participation obtained. Refreshments and a small care package of a grocery item was

136 provided for participation.

137

138   A team of specially trained data collectors interviewed caregivers and children at the site of

139   the CBO. Data was collected using cell phone technology. Interviews were conducted in

140   local languages and all questionnaire items were translated and back translated for accuracy

141   prior to use.

142   *Measures*

143   Questionnaires were completed at baseline and follow-up and comprised study specific and

144   short-forms of standardised inventories.

145   *Child mental health and resilience (baseline and follow-up)*

146   A combination of self-report and caregiver report symptom screens to assess child mental

147   health and functioning were used. Questionnaires were completed by children with the help

148   of trained fieldworkers with prior community work experience. Children of all ages provided

149   information, but cut-points for depression, suicidality and PTSD screens were only calculated

150   for children aged 7 or older.

151   Child measures were selected on validated instruments and those where tools had been used

152   in low/middle income country settings were prioritized. These included: Low self-esteem

153   (Rosenberg <15)[23], depression (Child Depression Inventory [CDI] ≥ 3)[24], suicidality (CDI

154   item: thought to kill self), Post-Traumatic Stress Disorder (TSCC: one re-experiencing, one

155   avoidance/numbing, one hyper-arousal symptom)[25], emotional and behavioural difficulties

156   (Strengths and Difficulties Questionnaire SDQ total difficulties≥ 5)[26]. The primary outcome

157   measure of resilience comprised 'sustained mental health' and was defined as the absence of

158   any above threshold symptom scores or suicidality on any measure at either baseline or

159   follow-up. The variable of 'resilience status' among orphaned children was determined by

160   the presence or absence of sustained good mental health at both baseline and follow-up.

161   Measures used were: Rosenberg self-esteem scale [23], assessing child levels of self-worth and

162   self-acceptance. Children aged 6 or older were asked to respond to 10 items on a 4-point

163   scale, ranging from disagree a lot' to 'agree a lot'. Scores for the positive self-esteem items

164   are reversed. Higher scores in the scale (range 0-30) indicate higher self-esteem. CDI – 10

165   items [27] assesses symptoms of depression. Children were asked to indicate the presence of

166   symptomology in the previous 2 weeks. Responses were coded on a 3-point scale: no

167   symptom, mild symptoms, and definite symptom. Mean scores were calculated with higher

168   scores indicating greater depressive symptomatology. Suicidal ideation was identified if

169   children reported having thoughts about killing themselves (CDI item). Trauma Symptom

170   Checklist for Children [28] was used to assess posttraumatic symptoms. Children were asked to

171   respond to 10 items exploring frequency of intrusive thoughts, sensations and memories of

172   painful past events, nightmares, fears, and cognitive avoidance of painful feelings. Responses

173   were coded on a 3-point scale ranging from 'never' to 'almost all the time'. Mean scores

174   were computed with higher scores indicating greater posttraumatic symptomatology.

175   Strengths and Difficulties Questionnaire [29] is a screen completed by caregivers including 10-

176   items, each describing a psychological or behavioural attribute (positive/negative) of the child

177   over the last 6 months. Subscales were related to emotional problems, conduct problems,

178   hyperactivity-inattention, and peer problems. A total score of the four problems scales was

179   computed with higher values indicating greater behavioural and emotional difficulties.

180   *Parental and family bereavements (baseline and follow-up)*

181   Information about paternal and maternal deaths and total number of family bereavements

182   were gathered by self-report at baseline. Orphanhood was defined according to the UNAIDS

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183 definition as the loss of one or both biological parents [30]. We also recorded recent parental

184 bereavements between baseline and follow-up.

185 *Demographic and socio-economic characteristics (baseline)*

186 Demographic information inclusive of age, gender and country of residence were collected

187 for all participants by caregiver report. Four indicators were used to assess family economic

188 status: 1. Food security was assessed using a caregiver report measure from the Child Status

189 Index [31]. Caregivers were asked to report whether their child had sufficient food to eat at all

190 times of the year. Responses were dichotomised as 'food secure (child is well fed and eats

191 regularly) versus 'food insecure'. 2. Grant receipt. Caregivers reported on whether they

192 received one or more of the following six grants into the home: a retirement pension, state

193 pension, disability grant, child support grant, foster care grant, or care dependency grant. 3.

194 Household employment was determined by child report of whether anyone in the household

195 had a paid job. 4. Housing. Children were asked to indicate which type of accommodation

196 they lived in (i.e., a house or a flat, a shack, on the street).

197 *Child characteristics (baseline)*

198 Caregiver report was used to indicate child's HIV status and whether the child had been

199 physically unwell over the past year (yes/no). Caregiver report was also used to assess

200 developmental disability using a 10 question screen reporting on domains of speech,

201 cognition, hearing, vision, and motor difficulties (Durkin, 1995). A child was considered to

202 have *screened positive* if the caregiver reported impairment on one or more of the ten

203 questions. Educational outcomes were assessed by caregiver report using questions from the

204 Child Status Index [31] that included school performance ("How do teachers report your child is

205 doing in school?" Responses were dichotomised as child does as well or better than most

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206   children vs. child struggles at school), learning progress ("Is the child quick to learn when

207   introduced to new chores and things?" (yes/no), being in the age-appropriate school grade

208   ("Is your child in the correct class for his or her age?" (yes/no), and regular attendance

209   ("Does your child go to school?" (yes regularly or no, not regularly).

210   *Family characteristics (baseline)*

211   Caregivers reported whether they were the biological parent of the child. Caregiver report

212   was also used to assess caregiver HIV status and HIV in the household. Caregiver mental

213   health was assessed using the Shona Symptom Questionnaire (SSQ) (Patel et al., 1997), a

214   validated measure to screen for symptoms of mood disorders (depression and anxiety) which

215   has been used in Zimbabwe[32], Tanzania[33], Zambia[34], South Africa and Malawi[35]. Scores of

216   eight or above indicated presence of common health problems. Caregivers also reported on

217   use of methods of discipline that involved punishment or maltreatment in the household [36].

218   Physical maltreatment was rated if caregivers reported slapping, punching, or hitting the

219   child, and emotional maltreatment was coded if caregivers called names or threatened to send

220   child away or kick the child out of the house.

221   Children reported on their role in the family, specifically if they were responsible for caring

222   for younger children in the household or ill family members. Domestic violence was coded if

223   children reported being slapped, punched or hit on their head or face, or beaten by an adult

224   living at home. The question was from a UNICEF measure commonly used in vulnerable and

225   orphaned children [37]. Positive caregiving was measured by an item assessing how often the

226   child received praise for doing something well, and coded as 'often' vs. 'rarely' or 'never'.

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228   *Community characteristics (baseline)*

229   All children provided information on experiences of stigma, social support and community

230   violence with the help of trained fieldworkers. Community stigma was assessed by self-report

231   on a five-item adaptation of the UNICEF measure [37]. The questions included being teased,

232   gossiped about, treated badly, feeling isolated or feeling that nobody cared about them

233   (yes/no). Responses were dichotomised into 'any stigma vs. none. Social support was

234   measured by asking children to report whether they felt supported by their local community,

235   whether they had friends, or whether they fitted in well. Responses were dichotomised into

236   low vs. high social support (top quartile). Community violence was coded if children reported

237   witnessing someone using a gun or knife to attack people outside home or experiencing an

238   attack themselves outside home. These items were drawn from the UNICEF measure

239   developed for vulnerable and orphaned children [37].

240   *Analyses*

241   A six-stage analysis strategy was carried out using IBM SPSS 22.0. First, we assessed

242   differences between orphaned children (any parent deceased) and non-orphaned children on a

243   range of child, family, socio-economic, and community characteristics. Second, we compared

244   rates of sustained mental health resilience (i.e., absence of mental health problems at both

245   baseline and follow-up) between orphaned and non-orphaned children. Third, we explored

246   differences in resilience status across the orphaned group according to, demographic factors

247   and bereavement experiences to determine to what extent sustained mental health resilience

248   amongst this vulnerable group varied by child age, gender and country, and by bereavement

249   risk exposure (type, number and timing of bereavement). This analysis was undertaken to

250   identify potential covariates to be added to subsequent models. Fourth, we used a series of

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251   logistic regression analyses to test associations between baseline factors and mental health

252   resilience among orphaned children. Odds ratios with 95% confidence intervals relate to

253   increases in probability of resilience per unit change in the predictor variables. Baseline

254   predictor variables were dichotomised into yes/no responses and included child, family,

255   economic and community factors. Additional analyses tested cumulative influences of

256   significant predictors of resilience among orphaned children (see Fig.1). Fifth, we examined

257   interactions between identified predictors and child age, gender and country. Lastly, logistic

258   regression analyses tested whether predictors of resilience varied across orphaned versus non-

259   orphaned children. Between-group analyses explored interactions between orphan status and

260   each predictor, and multivariate analysis tested the independent contribution of predictors.

261   **Results**

262   *Predictive factors and mental health outcomes among orphaned and non-orphaned children*

263

264   Of the 833 children, 490 (58.8%) had lost one or both parents (182 paternal orphans, 84

265   maternal orphans, 224 double orphans). Orphaned children were older on average (mean

266   age=9.6 years) compared to non-orphaned children (mean age=8.1 years), F=58.5, df=1,

267   p<.001. There were more orphaned children living in Malawi compared to South Africa

268   (70.1% vs. 56.4%, X^2=9.2, df=1, p=0.003). Orphan status did not differ by child gender.

269   Table 1 summarises the distribution of child, family, economic and community predictors by

270   orphan status.

271

272   [insert table 1]

273

274   Orphaned children were significantly less likely to be in the correct class for their age, were

275   less likely to experience physical or emotional abuse and were more likely to care for a sick

276   person at home. Orphaned children had lower food security and household employment but

277   were less likely to live in a shack.

278

279   *Mental health resilience*

280

281   One quarter of orphaned children (70 girls, 54 boys) showed no mental health problems at

282   either wave and were classified as resilient (Table 2). There were equal proportions classified

283   as resilient within the orphaned group compared to the non-orphaned group.

284

285   [insert table 2]

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287

288   *Mental health resilience among orphaned children*

289

290   Resilience status within the orphan group did not differ by child age (OR=1.03, 95% CI=

291   0.95, 1.11) or gender (female: OR=1.20, 95% CI=0.80, 1.91). Fewer children in South Africa

292   compared to Malawi were classified as resilient (22.9% vs. 34.7%, OR: 0.56, 95% CI: 0.35,

293   0.90, p=0.02). Additional tests showed that there were no differences in resilience status

294   according to whether the child's mother had died (OR=1.38, 95% CI= 0.78, 2.46), both

295   parents had died (OR=1.47, 95% CI= 0.97, 2.22), or total number of family bereavements

296   (OR: 1.10, 95% CI=0.48, 2.51). Six children experienced parental bereavement between

13

297   baseline and one-year follow-up. Bereavement during this period was not associated with

298   resilience status in the orphaned group (OR: 0.81, 95% CI: 0.32, 2.05).

299

300   *Predictors of mental health resilience among orphaned children*

301

302   Table 3 shows a series of regression analyses testing associations between baseline factors

303   and mental health resilience among orphaned children. As shown, child HIV status,

304   developmental disability, and physical health were not associated with resilience. Children

305   described as quick learners were more likely to be resilient.

306

307   There were many family factors associated with mental health resilience. Child exposure to

308   domestic violence and harsh physical punishment (e.g., hitting the child with a hard object)

309   were negatively associated with resilience, while positive caregiving (e.g., praise) and the

310   child taking the role of caring for ill people in the household were associated with greater

311   probability of resilience. Caregiver characteristics, which included being a biological parent,

312   HIV status, and mental health were not associated with mental health resilience.

313

314   Household employment was significantly associated with resilience status. Other economic

315   indicators, such as food security, housing conditions and grant receipt were not associated

316   with resilience. Child experience of stigma in the local community was negatively associated

317   with resilience, whilst community support predicted greater probability of resilience.

318   Exposure to community violence was high, but was not associated with resilience.

319

320   [insert table 3]

14

321 As shown in Fig. 1., a cumulative count of baseline factors identified as predictors of

322 resilience within orphaned children showed a statistically significant association with

323 resilience status (OR=1.42, 95% CI=1.21, 1.66, p<.001), with rates of resilience varying from

324 0 to 42.3%. Of note is that only four children benefited from protective experiences across all

325 eight factors.

326

327 [insert figure 1]

328

329

330 In addition, we explored whether predictors of mental health resilience among orphaned

331 children varied according to child gender, age and country of residence. Predictors included:

332 quick learning, no exposure to domestic violence, no harsh physical punishment, positive

333 caregiving (praise), child role in helping ill family members, household employment, no

334 community stigma, and high community support. There were no significant interactions by

335 child gender, age or country on resilience.

336

337 *Predictors of mental health resilience among orphaned vs. non-orphaned children*

338

339 Finally, we tested whether predictors of sustained mental health resilience varied across

340 orphaned and non-orphaned children. Table 4 presents findings from the full study sample.

341 Predictors of child resilience over time included: child factors (being in good health, good

342 school performance, quick learning), family factors (having a HIV negative caregiver, having

343 a caregiver with no mental health problems, no exposure to domestic violence, no harsh

344 physical punishment, positive caregiving (praise)),economic factors (household employment,

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345 living in a house or flat, and receipt of household grant). There were no significant

346 interactions between predictors of resilience and orphan group. A final multivariate analysis

347 using the full sample (see Table 4) showed that only two factors remained strong independent

348 predictors of mental health resilience: learning quickly and living in good housing conditions.

349

350 **Discussion**

351 The rates of parental bereavement were notably high with 58% of children experiencing the

352 death of one or both parents. Among this group, predictors of resilience were whether the

353 child was seen as a quick learner. This may reflect an astute child who picks up and responds

354 to the world in such a way that resilience is enhanced. It may also relate to a child who

355 manages school learning quickly and thus any pressure from school and learning tasks are

356 eased. Child exposure to domestic violence and harsh physical punishment were negatively

357 associated with resilience. This supports previous studies, showing the negative effects of

358 maltreatment [20;38]. It is well established that positive parenting is of benefit to both younger

359 and older children [39;40]. This study shows that in line with the literature, positive caregiving

360 (e.g., praise) was associated with greater probability of resilience. Of interest was the

361 additional finding that resilience was predicted for a child taking the role of caring for ill

362 people in the household. This may reflect that challenging home environments results in

363 children having to experience and learn about hardships and support. Other caregiver

364 characteristics, which included being a biological parent, HIV status, and mental health were

365 not associated with resilience. Household employment was significantly associated with

366 resilience status. The explanations around this association may relate directly to the income

367 generation associated with employment, but may also be accounted for with out of home

368 working, job satisfaction and exposure to the job market.   Unlike studies with adolescents,

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369 for this age group, other economic indicators, such as food security, housing conditions and

370 grant receipt were not associated with resilience [20;38]. The social environment seems to be an

371 important factor consistent with adolescent findings. Child experience of stigma in the local

372 community was negatively associated with resilience, whilst community support predicted

373 greater probability of resilience. Resilience rates dropped at the second time point. A recent

374 study on predictors of mental health resilience rates in orphaned children in South Africa also

375 reported a drop in resilience rates at the second wave.[20] The literature suggests that protective

376 factors are complex and multiple protectors need to be in place.[41]

377

378 When these predictors of resilience were examined to explore cumulative influences, a

379 significant effect was noted. At the lowest, with those experiencing one of the seven

380 predictors, the rates of resilience were 11.1% climbing to 42.3% when 7 predictors were

381 present. Only 4 children experienced all 8 protective factors.

382

383 There were a number of similarities between the younger children and data from older

384 adolescents [20;38]. The rate of resilience among AIDS orphaned adolescents was 16% of the

385 sample (69 resilient out of 425 parentally bereaved adolescents) [20]. The rates in our study

386 showed a quarter to be resilient (124 resilient out of 490 parentally bereaved young children).

387 Parenting, environment and economic factors were relevant predictors for adolescents and

388 younger children. However, young children with cognitive abilities (quick learners) fared

389 well and, in addition; young children faced with challenging responsibility (caring for sick

390 family) also built on such experience which was seen as a predictor of resilience. It is

391 possible that children can learn and adapt from both positive and negative experiences. It

392 may well be that different challenges occur at different ages. The best way to examine

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393   ongoing trajectories of resilience would be to utilize longitudinal data. There may also be

394   specific differences for those faced with trauma in early childhood compared to those first

395   facing trauma in adolescence. The resources to cope and adjust may also vary with age.

396

397   This study gives some insight into child resilience for younger children, and exhibits clearly

398   the kinds of environmental and psychosocial provision that predicts such resilience. It

399   highlights areas for possible intervention and policy such as addressing risk factors in the

400   household (violence, unemployment) and in the community (stigma, low support). The study

401   has some strengths related to the high response rate, the detailed information gathered from

402   both caregiver and child responses and the use of validated measures.   The sample size was

403   sufficient to explore these issues. Limitations relate to the nature of the mental health

404   measures, the fact that positive parenting was only measured by a single variable, the fact that

405   very young children were not eligible to complete these measures and that the working

406   operationalisation of resilience may present some limitations. These could relate to the

407   variables chosen, the cut off points used and the breadth of concept coverage.   No

408   standardized resilience measure has been validated in this population, and this working

409   definition was derived from other published studies. Demographic data was collected at

410   baseline and changes in such variables at follow up was not recorded for every variable. The

411   fact that these children were drawn from CBO's may reflect those already able to access

412   support and further research should aim to study all community children to see if CBO

413   exposure was a factor.

414

415

416 A recent review of the literature on mental health of HIV affected children in sub-Saharan

417 Africa [14] noted that there was a risk of pathologising healthy children. Of the 31 articles

418 identified for their review, the majority (23) focused on psychological distress and only eight

419 provided some insight into positive mental health such as coping, adaptation and resilience.

420 This study stresses the need to focus on resilience and positive mental health and our data

421 lends support for the existence of such resilience, the fact that it endures over time and

422 provides some insight into the likely predictors of such resilience for younger children.

423

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541   Fig. 1. Cumulative count of predictors of resilience within orphaned children at baseline

542   (N=124). The figure shows the percentage of children with no mental health problems at

543   either study wave according to total number of significant protective factors present or risk

544   factors absent (range 0-8). The eight dichotomised predictors (yes/no) are: quick learning, no

545   exposure to domestic violence, no harsh physical punishment, positive caregiving (praise),

546   child role in helping ill family members, household employment (at least one adult in the

547   child's home has a job), no community stigma, and high community support (top quartile).

Table 1. Distribution of baseline risk and protective factors by orphan status

	Any orphan % N=490	Non-orphan % N=343	X^2 (df=1), p value
Child			
HIV+ child	15.3	12.0	1.9
Developmental disability (any)	43.7	46.4	0.6
Child in good health	82.2	77.0	3.5
Child does well at school	83.6	84.7	0.2
Child is a quick learner	70.9	75.8	2.3
Child is in correct class for their age	65.9	78.2	14.3***
Child attends school regularly	96.5	94.8	1.4
Family			
Living with biological parent	24.1	77.3	229.7***
HIV+ caregiver	15.8	25.4	11.4**
Caregiver has MH problems (SSQ cutoff>8)	26.4	29.9	1.2
Other HIV+ family members	32.9	35.6	0.66
Domestic violence (any)	47.6	49.9	0.4
Harsh discipline – physical abuse (any)	43.9	53.6	7.7**
Harsh discipline – emotional abuse (any)	41.6	53.1	10.6**
Positive parenting – praise	80.4	78.4	0.5
Child cares for sick family	45.4	35.3	7.3**
Child cares for younger children	53.0	55.4	0.4
Community			
Stigma (any)	29.1	31.0	0.29
Social support (top quartile)	76.3	69.1	5.4*
Violence (any)	45.0	38.9	3.0
Economic indicators			
Food security	68.4	76.7	6.9*
Household employment	49.4	59.2	7.8**
Child lives in a shack	8.6	21.3	27.4***
Household receives grant (any)	71.8	74.1	0.5

*p<.05, **p<.01, *** p<.001
Orphaned children were significantly older on average (*M* age=9.6 years) compared to non-orphaned children (*M* age=8.1 years), p<.001.

Table 2. Proportion of children without any mental health problem at baseline, at follow-up and on both occasions

Resilience [a]	Any orphan N=490	Non-orphan N=343
Baseline	335 (68.4%)	230 (67.1%)
Follow-up	164 (33.5%)	103 (30.0%)
Both occasions	124 (25.3%)	74 (21.6%)

[a]Resilience (i.e., no depression, trauma symptoms, emotional or behavioural problems and suicidality)

No significant differences of resilience status by orphanhood (all p>0.3).

Table 3. Predictors of sustained mental health resilience among orphaned children (N=124)

	Factor present % resilient	Factor absent % resilient	OR [95% CI]
Child			
HIV+ child	28.0	24.8	0.85 [0.49, 1.47]
Developmental disability (any)	22.0	27.9	0.73 [0.48, 1.10]
Child in good health	26.8	18.4	1.63 [0.91, 2.92]
Child does well at school	26.9	19.0	1.57 [0.86, 2.87]
Child is a quick learner	30.5	13.6	2.80 [1.64, 4.78]***
Child is in correct class for their age	25.9	25.0	1.05 [0.68, 1.62]
Child attends school regularly	25.6	23.5	1.12 [0.40, 3.51]
Family			
Living with biological parent	28.8	24.2	1.27 [0.80, 2.02]
HIV+ caregiver	26.6	18.2	0.61 [0.33, 1.14]
Caregiver has MH problems (SSQ cutoff>8)	21.4	26.7	0.75 [0.46, 1.20]
Other HIV+ family members	22.4	26.7	0.79 [0.51, 1.23]
Domestic violence (any)	20.2	30.1	0.59 [0.39, 0.89]**
Harsh discipline – physical abuse (any)	17.2	31.6	0.45 [0.29, 0.70]***
Harsh discipline – emotional abuse (any)	22.5	27.3	0.78 [0.51, 1.18]
Positive parenting – praise	27.9	14.6	2.27 [1.24, 4.17]**
Child cares for sick family	30.5	22.1	1.55 [1.01, 2.37]*
Child cares for younger children	25.7	26.2	1.02 [0.67, 1.56]
Economic indicators			
Food security	23.3	29.7	0.72 [0.47, 1.10]
Household employment	29.4	21.1	1.56 [1.03, 2.36]*
Child lives in house or flat	25.9	19.0	1.49 [0.67, 3.30]
Household receives grant (any)	30.0	23.0	1.43 [0.92, 2.22]
Community			
Stigma (any)	17.7	29.4	0.52 [0.31, 0.86]**
Social support (top quartile)	26.5	21.6	1.31 [0.80, 2.16]*
Violence (any)	37.9	47.4	0.67 [0.45, 1.03]

*p<.05, **p<.01, *** p<.001
Resilience (i.e., no depression, trauma symptoms, emotional or behavioural problems and suicidality)
Sustained resilience (i.e, absence of mental health problems at both occasions)

Table 4. Multivariate analysis predicting sustained mental health resilience among orphaned and non-orphaned children (including interactions by orphan group), N=833

	Univariate OR [95% CI]	Interactions OR [95% CI]	Multivariate OR [95% CI]
Child			
HIV+ child	0.75 [0.49, 1.17]	n.s.	
Developmental disability (any)	0.86 [0.62, 1.19]	n.s.	
Child in good health	1.78 [1.14, 2.78]**	n.s.	1.41 [0.88, 2.25]
Child does well at school	1.91 [1.15, 3.17]*	n.s.	1.08 [0.59, 2.00]
Child is a quick learner	2.87 [1.85, 4.46]***	n.s.	2.44 [1.44, 4.14]***
Child is in correct class for their age	0.97 [0.68. 1.38]	n.s.	
Child attends school regularly	1.90 [0.73, 4.99]	n.s.	
		n.s.	
Family		n.s.	
Living with biological parent	0.97 [0.71, 1.34]	n.s.	
HIV+ caregiver	0.61 [0.39, 0.95]*	n.s.	0.72 [0.46, 1.15]
Caregiver has MH problems (SSQ cutoff>8)	0.69 [0.47, 1.00]*	n.s.	0.78 [0.52, 1.16]
Other HIV+ family members	0.76 [0.53, 1.07]	n.s.	
Domestic violence (any)	0.61 [0.44, 0.85]**	n.s.	0.72 [0.52, 1.03]
Harsh discipline – physical abuse (any)	0.59 [0.42, 0.81]***	n.s.	0.78 [0.55, 1.11]
Harsh discipline – emotional abuse (any)	0.75 [0.54, 1.04]	n.s.	
Positive parenting – praise	1.66 [1.08, 2.57]*	n.s.	1.44 [0.91, 2.26]
Child cares for sick family	1.34 [0.95, 1.88]	n.s.	
Child cares for younger children	1.18 [0.84, 1.66]	n.s.	
		n.s.	
Economic indicators		n.s.	
Food security	0.73 [0.51, 1.02]	n.s.	
Household employment	1.37 [0.99, 1.88]*	n.s.	1.30 [0.92, 1.82]
Child lives in house or flat	1.94 [1.13, 3.34]*	n.s.	1.72 [1.00, 3.02]*
Household receives grant (any)	1.67 [1.18, 2.35]**	n.s.	1.29 [0.88, 1.89]
		n.s.	
Community		n.s.	
Stigma (any)	0.52 [0.35, 0.78]	n.s.	
Social support (top quartile)	1.36 [0.94, 1.99]	n.s.	
Violence (any)	0.76 [0.54, 1.05]	n.s.	

*p<.05, **p<.01, *** p<.001
Resilience (i.e., no depression, trauma symptoms, emotional or behavioural problems and suicidality)
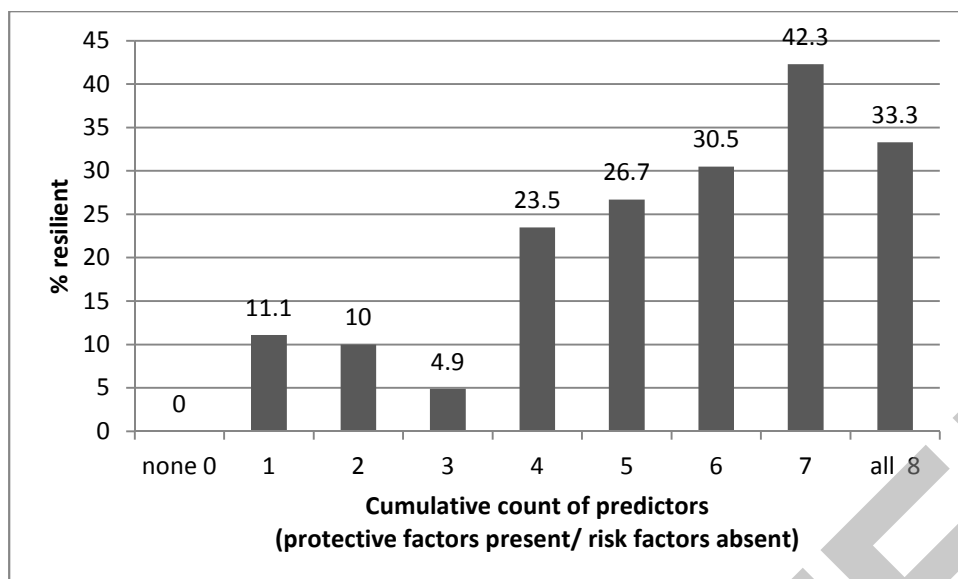Sustained resilience (i.e, absence of mental health problems at both occasions)

Fig. 1. Cumulative count of predictors of resilience within orphaned children at baseline (N=124). The figure shows the percentage of children with no mental health problems at either study wave according to total number of significant protective factors present or risk factors absent (range 0-8). The eight dichotomised predictors (yes/no) are: quick learning, no exposure to domestic violence, no harsh physical punishment, positive caregiving (praise), child role in helping ill family members, household employment (at least one adult in the child's home has a job), no community stigma, and high community support (top quartile).