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Perceived social support and psychological wellbeing of children orphaned by HIV/AIDS in Southwestern Uganda

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Abstract

Evidence points to a correlation between perceived social support and children's psychological well-being globally. However, only a few studies have examined the relationship between perceived social support (PSS) from multiple sources and children's psychological outcomes. Even fewer studies have examined the relationship between perceived social support from multiple sources and the psychological outcomes of children orphaned by HIV/AIDS in Sub-Saharan Africa (SSA). This study examines whether PSS from multiple sources (parents/caregivers, teachers, friends and classmates) and family cohesion are independently and collectively associated with the psychological well-being of children orphaned by HIV/AIDS in Uganda. This study used baseline data from a National Institute of Health (NIH)-funded Suubi-Maka (Hope for families) study, conducted in Southwestern Uganda. A total of 346 child-caregiver dyads from 10 comparable primary schools participated in the study. Multivariate and multivariable regression analyses were conducted to examine: (1) variations in PSS from multiple sources and family cohesion, and (2) the relationship between PSS, family cohesion and children's psychological outcomes, measured by depression, hopelessness, and self-concept. Controlling for participants' demographic and household characteristics, the combined measure of PSS from multiple sources was positively associated with self-concept ($b = .32$, 95% CI = .23, .41, $p = .001$) and negatively associated with hopelessness ($b = -.19$, 95% CI = $-.29$, $-.09$, $p = .001$) and depressive symptoms ($b = -.13$, 95% CI = $-.23$, $-.03$, $p = .01$). PSS from parents/guardians and teachers was a significant predictor. In addition, family cohesion was positively associated with self-concept ($b = .37$, 95% CI = .15, .58, $p = .001$) and negatively associated with depressive symptoms ($b = -.36$, 95% CI = $-.59$, $-.13$, $p = .01$). Findings indicate that family cohesion and perceived social support, especially from parent/caregivers and teachers were associated with better children's psychological outcomes. In HIV-impacted communities, interventions designed to strengthen family relationships and social support are essential to offset children's psychological well-being.

Keywords

Perceived social support; family cohesion; psychological well-being; AIDS-affected children; Uganda

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Introduction

Sub-Saharan Africa (SSA) bears a disproportionate global burden of HIV/AIDS orphans. Of an estimated 16.5 million children (0–17 years) that had lost at least one parent as a direct result of AIDS globally by 2016, (UNICEF, 2017), SSA accounted for more than 80 percent (13.8 million) (UNICEF, 2017). Among SSA countries impacted by the epidemic, Uganda is one of the most affected, with an estimated 1.2 million children orphaned by HIV/AIDS – hereafter, orphaned children (International HIV/AIDS Alliance, 2008; Karimli & Ssewamala, 2015). Orphaned children experience parental death and subsequent life changes that are often associated with several stressors (Okawa et al., 2011) and negative influences on child development (Han, Ssewamala, & Wang, 2013). A study on orphaned children in urban communities in South Africa found that children orphaned by HIV/AIDS lost close human relationships to bereavement, change of caregivers and repeated moving (Cluver & Gardner, 2007). Several studies in SSA found that orphaned children are more likely to experience hopelessness, depression, anxiety, and post-traumatic stress disorder compared to children orphaned by other causes or nonorphans (Atwine, Cantor-Graae, & Bajunirwe, 2005; Cluver, Orkin, Gardner, & Boyes, 2011; Nyamukapa et al., 2010). Therefore, the evidence suggests that HIV/AIDS-related loss of parents is associated with increased vulnerability as well as lasting and persistent psychological distress.

Most orphaned children come from unstable family economic situations in poorly-resourced communities (Han et al., 2013). Parental illness and death often worsen their economic burden, leading to limited access to basic needs, including health care services and withdrawal from school (Okawa et al., 2011). Parental loss and related worsening economic situations are associated with increased children's vulnerability to several situations detrimental to their development. These children are likely to face stigma and discrimination (Cluver, Gardner, & Operario, 2008), or be pressured to assume adult responsibilities like taking formal or informal labor to support families (Ssewamala et al., 2015), which in turn increases the risk of exposure to child labor and sexual exploitation and living on the street (Levine, Foster, & Williamson, 2005). In such circumstances, high-risk behaviors like sexual promiscuity and substance abuse are very likely (Bolland, 2003; DuRant, Cadenhead, Pendergrast, Slavens, & Linder, 1994). Experiencing risky and difficult situations may also increase orphaned children's feelings of hopelessness (Betancourt, Meyers-Ohki, Charrow, & Hansen, 2013). Studies found hopelessness to be a long-term predictor of suicidal ideation, intent, and behavior (Becker-Weidman et al., 2009; Thompson, Mazza, Herting, Randell, & Eggert, 2005).

In low resource settings, community-based interventions implemented to improve the conditions of orphaned children (Han et al., 2013; Okawa et al., 2011) include educational assistance, home-based care, legal protection, and psychosocial support (Becker-Weidman et al., 2009). Although counselling has been suggested as a specific psychological intervention (Makame, Ani, & Grantham-McGregor, 2007; Zhao et al., 2009), its availability and sustainability in low resource settings is limited (Okawa et al., 2011). Additional services that address other aspects of the psychological well-being of orphaned children are required.

Perceived social support for children orphaned by HIV/AIDS

Social support (SS) involves the exchange of resources between individuals to enhance a recipient's well-being (Callaghan & Morrissey, 1993; Zhao et al., 2011). SS has structural and functional dimensions. Structural dimensions of SS include social network characteristics like size, density and sources of support (Shumaker & Brownell, 1984; Zhao et al., 2011). For orphaned children, sources of support may include family/parents/caregivers, friends, teachers, and classmates among other members or community. Functional dimensions describe types of support provided including informational, emotional, material/tangible/instrumental support, appraisal support, and group belonging or social interactions (Callaghan & Morrissey, 1993; Zhao et al., 2011). SS functions can also be received or perceived social support. While received social support describes the actual support provided, PSS refers to the recipient's perception that other people are available to provide the needed support when sought (Holt-Lunstad & Uchino, 2015). Lack of social supportive exchanges or interactions and a perception that SS is inadequate are associated with poor mental and physical health (Allgöwer, Wardle, & Steptoe, 2001).

SS is associated with reduced incidence of mental illness (Callaghan & Morrissey, 1993), including the psychological well-being of children affected by HIV/AIDS (Nabunya, 2016; Okawa et al., 2011; Zhao et al., 2011). In China, PSS was positively associated with the psychological status of children orphaned by HIV/AIDS (Hong et al., 2010; Zhao et al., 2011). However, very few studies have examined the independent and collective contributions of PSS from multiple sources to mental health outcomes among orphaned children in SSA (Okawa et al., 2011). Given the viability of informal sources of SS formed within and outside the extended family in SSA (Nabunya, 2016), more evidence is needed to understand the individual and collective contribution of both parental and non-parental sources of SS (e.g., teachers, classmates and friends), specifically among children orphaned by HIV/AIDS. Moreover, studies tend to assess the receipt of SS without considering whether recipients of support perceive it to be supportive or not (Holt-Lunstad & Uchino, 2015).

This paper examines whether PSS from multiple sources, (including parent/caregiver, teachers, friends, and classmates), and family cohesion are associated with psychological well-being, measured by depressive symptoms, self-concept, and hopelessness, among children orphaned by HIV/AIDS. This study has two objectives; (1) to examine the sociodemographic determinants of PSS from multiple sources, and (2) to examine whether PSS from multiple sources (parental/caregiver, teachers, friends, and classmates) and family cohesion are independently and collectively associated with depressive symptoms, self-concept and hopelessness scores. This study contributes to a better understanding of, (1) the combined and unique functions of different sources of SS to psychological well-being, and (2) may guide the effective mobilization of SS from multiple sources for different aspects of the psychosocial functioning of children orphaned by HIV/AIDS in SSA.

Methods

Data and study sample

This study uses baseline data drawn from Suubi-Maka study, a four-year (2008–2012) cluster randomized experimental design with three waves (baseline, 12, and 24 months post-baseline) in the Rakai and Masaka districts. The Suubi-Maka (Hope for families) study, was funded by National Institute of Mental Health (RMH081763A; PI: Fred Ssewamala), to examine a family economic empowerment intervention among poor families providing care and support to children orphaned by HIV/AIDS. A total of 346 child-caregiver dyads were recruited from 10 rural public primary schools in Rakai and Masaka District of Southwestern Uganda – two political districts heavily affected by HIV and AIDS. The schools were matched on several socioeconomic characteristics per the Uganda Ministry of Education guidelines and school records, including enrolment under the universal primary education (PLE) national policy, school performance (based on the national primary leaving examinations -PLE), average school enrolment and socioeconomic status of the students' body i.e. from poor households. Adolescents were eligible to participate if they: 1) identified as an orphaned child (having lost one or both parents to AIDS); 2) were in their last two years of primary schooling (equivalent to the 6th and 7th grades in the US education system); and 3) lived within a family and not an institution – children in institutions have different needs.

Data collection and measures

This study utilized baseline data collected using a 90-minute survey administered by trained Ugandan interviewers. All instruments were translated into Luganda (the local language spoken in the study area) and back-translated into English to ensure accuracy. The Suubi-Maka study received IRB approval from Columbia University (IRB-AAAD 2525) and the Uganda National Council for Science and Technology. The study protocol is registered in the Clinical Trials Database.

All measures have been tested in previous studies among AIDS-affected children in sub-Saharan Africa (Ismayilova, Ssewamala, Mooers, Nabunya, & Sheshadri, 2012; Karimli & Ssewamala, 2015; Osuji et al., 2018; Ssewamala, Han, Neilands, Ismayilova, & Sperber, 2010). To assess children's psychosocial functioning, the analysis used three outcome measures; (1) depression, (2) hopelessness, and (3) self-concept. Depression was measured using 27 items adapted from the Child Depression Inventory (CDI) (Kovacs, 1985). The CDI scale is used to assess children's depressive symptoms using sample items grouped in sets of three: 'I am sad occasionally', 'I am sad many times', and 'I am sad all the time.' Items in the inverse direction were reverse coded to create summated scores, with high scores indicating high levels of depressive symptoms. This scale had a range of 29.01–82.42, and a Cronbach's alpha of .68. Hopelessness was measured using 20-items adapted from the Beck Hopelessness Scale (BHS) (Beck, Weissman, Lester, & Trexler, 1974). BHS scale measures hopelessness and pessimistic attitudes toward the future. For example: 'I look forward to the future with hope and enthusiasm,' 'I have great faith in the future,' and 'My future seems dark,' coded as 'True' or 'False.' Just like CDI, items in the inverse direction were reverse coded to create summated scores. High scores indicate high levels of child hopelessness.

The range for this scale was 32.88–80.85, with a Cronbach's alpha of .66. Self-concept was measured using the Tennessee Self-Concept Scale (Fitts & Warren, 1996). The 20-item scale measures which focus on children's perception of identity, self-satisfaction, and other behaviors on a 5-point scale (with 1 = 'always false' and 5 = 'always true'). Sample questions include: 'I like the way I look', 'I don't feel as well as I should', and 'I hate myself.' Items in the inverse direction were reverse coded to create summated scores. High scores indicate high levels of child self-concept. This scale range was between 21.39–70.37, and the Cronbach's alpha was .74.

PSS was measured using two indicators: 1) a measure of perceived social support from multiple sources including close friends, classmates, teachers and caregivers, adapted from the Friendship Qualities Scale (Bukowski, Hoza, & Boivin, 1994), p. 2) perceived caregiver support adapted from the Family Environment Scale (Moos & Moos, 1994) and the Family Assessment Measure (Skinner, Steinhauer, & Santa-Barbara, 2009). The 24-items scale (alpha = 0.76) assesses the impressions of the quality of children's friendships and relationships with their caregivers, classmates, closest friends, and teachers on a 5-point scale (with 1 = 'never' and 5 = 'always'). Sample items include: 'Some kids have a guardian who don't really understand them.' 'Some kids do have a teacher who cares about them.' 'Some kids have a close friend who they can talk to about things that bother them.' The range for the total scale was 64 – 120, with higher scores indicating higher levels of PSS from multiple sources. Family cohesion was assessed using 6-items (alpha = 0.64) that measure the degree of commitment, help and support family members provide for one another. Family cohesion items were adapted from the Family Environment Scale (Moos & Moos, 1994) and the Family Assessment Measure (Skinner et al., 2009). Participants were asked to rate how often each item occur in their family, on a 5-point scale (with 1 = 'never' and 5 = 'always'). Sample items include: 'Do your family members ask each other for help before asking non-family members?' and 'Do your family members feel close to each other?' Summary scores were generated with higher scores indicating higher levels of family cohesion. Control variables included in the models were: participants' age, gender, orphanhood status (single orphan versus double orphan), the total number of children in the household, and the total number of people in the household.

Data analysis procedures

Statistical analysis was conducted using STATA IC version 15.1 (Stata Corp., TX). Descriptive analyses were conducted on participants' individual and household demographic characteristics, measures of perceived social support and measures of children's psychological well-being. Multivariate and multivariable regression analyses were conducted to address study objectives 1 & 2. For study objective #1, regression models were conducted to examine the sociodemographic determinants of PSS from each of the four sources of SS independently (model 1), PSS from multiple sources combined (model 2), and Family cohesion (model 3). For study objective #2, two models were conducted to examine the association between 1) a combined measure of PSS, family cohesion and psychological well-being (model 1), and 2) PSS from each source individually, family cohesion and measures of psychological well-being (model 2). Statistical significance was set at a p-value less than the 0.05 level.

Results

Sample socio-demographic and household level characteristics

Results of the baseline characteristics of the sample are summarized in Table 1. The average age of participants was 13.4 years. Sixty-five percent of the sample were females, and most participants (70%) are single orphans (had one surviving biological parent). Thirty-six percent (36%) of participants had a surviving biological parent or a grandparent as their primary caregiver. Participants lived in households with an average of seven people. Also, participants had moderate levels of perceived social support and psychological well-being. The itemized descriptive analysis of perceived social support from multiple sources and family cohesion are presented in Table 2.

The socio-demographic determinants of PSS

Table 3 presents regression analysis results assessing the variations in perceived social support based on the participants' individual and household socio-demographic characteristics. Three models were conducted: Model 1 assessed the variations in PSS scores from each of the four sources of social support independently; Model 2 assessed variations in PSS total score; and Model 3 assessed variations in family cohesion. In model 1, significant variations were reported within PSS from caregiver/parent and classmates only. Specifically, gender ($b = 1.7$, 95% CI = .89, 2.6, $p = .001$), primary caregiver type ($b = 1.1$, 95% CI = .12, 1.99, $p = .05$), and number of children in the household ($b = .45$, 95% CI = .03, .87, $p = .05$) were significant predictors of PSS. Girls reported significantly higher PSS from their parent/guardian compared to boys. Having a surviving biological parent as the primary caregiver, as well as having more children in the household were all significantly associated with higher PSS from a parent/guardian. Also, girls reported significantly higher PSS from classmates compared to boys ($b = .92$, 95% CI = .07, 1.8, $p = .05$). In model 2, the combined PSS from multiple sources varied based on gender ($b = 4.0$, 95% CI = 1.5, 6.5, $p = .01$) only. Girls reported significantly higher PSS from multiple sources compared to boys. In model 3, significant variations in family cohesion were observed within three characteristics: orphanhood status ($b = 1.7$, 95% CI = .41, 2.98, $p = .01$), number of children ($b = -.71$, 95% CI = -1.3, -.17, $p = .01$) and number of people in the household ($b = .52$, 95% CI = 06, .99, $p = .05$). Specifically, double orphans reported significantly higher levels of family cohesion compared to single orphans. Having more individuals and fewer children in the household were also significantly associated with higher levels of family cohesion.

PSS from multiple sources, family cohesion and psychological well-being

Results from regression analyses examining the associations between PSS from multiple sources and measures of psychological wellbeing, i.e. depression, self-concept, and hopelessness are presented in Table 4. In model 1, the combined PSS from multiple sources was significantly associated with lower levels of depression ($b = -.13$, 95% CI = -.23, -.03, $p = .01$), lower levels of hopelessness ($b = -.19$, 95% CI = -.29, .09, $p = .001$), and higher levels of self-concept ($b = .32$, 95% CI = .23, .41, $p = .001$). Similarly, family cohesion was significantly associated with lower levels of depression ($b = -.36$, 95% CI = -.59, -.13, $p = .01$) and higher levels of self-concept ($b = .37$, 95% CI = .15, .58, $p = .001$). Overall,

combined PSS from all sources and family cohesion were significantly associated with better children's psychological wellbeing, including lower levels of depressive symptoms and hopelessness, as well as higher levels of self-concept.

Finally, in model 2, PSS from parent/caregiver ($b = .58$, 95% CI = .28, .89, $p = .001$) and teachers ($b = .56$, 95% CI = .26, .86, $p = .001$), were associated with high levels of self-concept. In addition, high levels of PSS from parent/caregiver were significantly associated with lower levels of hopelessness ($b = -.63$, 95% CI = $-.96, -.30$, $p = .001$) and higher levels of self-concept ($b = .58$, 95% CI = .28, .89, $p = .001$). Family cohesion was also significantly associated with lower levels of depression ($b = -.33$; 95% CI = $-.57, .10$, $p = .01$) and high levels of self-concept ($b = .36$, 95% CI = .17, .57, $p = .001$). Overall, results from this model indicate that PSS from parent/caregiver, teacher and family cohesion are significant predictors of children's self-concept, hopelessness and depressive symptoms.

Discussion

This study sought to [1] examine the socio-demographic determinants of PSS from multiple sources, and [2] establish whether PSS from multiple sources (parent/caregivers, teachers, friends, and classmates) and family cohesion are independently and collectively associated with the psychological well-being of children orphaned due to HIV/AIDS. First, our results suggest gendered variations – girls report higher levels of PSS from their parent/guardian, teachers and classmates, compared to boys. One possible explanation is that in the Uganda context, while boys are trained to take on household responsibilities, including being the primary breadwinners, girls are socialized to take on the caregiving role, especially in the absence of biological parents. It is therefore possible that girls attract more support early on, in preparation of (current) and future caregiving roles. These findings are consistent with previous studies that found significant gendered variations in PSS from multiple sources among adolescents (Malecki & Demary, 2002; Rueger, Malecki, & Demaray, 2008).

Also, socio-demographic and household characteristics (orphanhood status, primary caregiver, and number of people, and children in the household) are important predictors for PSS. There are several explanations for these findings: children who have lost both parents (double orphans) tend to perceive others as supportive – especially members of their extended family, compared to single orphans. Furthermore, in caregiving relationships, biological relatedness matter, as individuals tend to support those they are closely related to (Gray & Brogdon, 2017). This could partly explain why having a surviving biological parent as the primary caregiver was associated with high levels of PSS. Finally, having more individuals and fewer children in the household may be a source of family cohesion, as more adults are available to take care of children's needs, as well as provide closeness and comfort, as needed. Overall, these findings are consistent with previous study findings conducted in Kenya that found sociodemographic factors to be significant determinants of PSS among children orphaned due to HIV/AIDS (Okawa et al., 2011).

Further, study findings also suggest that higher levels of PSS and family cohesion were associated with children's psychological well-being, i.e. lower levels of depressive symptoms and hopelessness, and higher levels of self-concept. PSS from parents/caregivers

and teachers were significant predictors. Given that this sample is made up of children orphaned due to HIV/AIDS, it is possible that their peer interaction experiences are undermined by other factors beyond the scope of this study, including stigma and discrimination that tend to impact children and families affected by HIV negatively. These findings, however, expand on the empirical evidence showing that social support, especially from family members, is a robust protective factor against negative psychosocial outcomes (Rueger et al., 2008; Rueger, Malecki, Pyun, Aycok, & Coyle, 2016; Stice, Ragan, & Randall, 2004). Moreover, these findings are consistent with studies that demonstrated that disaggregating sources of support strengthens the case for the need to understand subtle differences in the critical role that various people can have in the lives of orphaned children (Rueger et al., 2008; Stice et al., 2004; Zhao et al., 2011). For children orphaned due to HIV/AIDS, understanding how both individual socio-demographic factors and family characteristics shape children's experiences and assessment of social support from multiple sources is essential. It enables us to highlight relationships that could be considered most important in any given domain of support (Rueger et al., 2008) and to identify relationships that specifically support specific aspects psychological functioning.

Limitations

The study's use of self-reported data means findings could be affected by social desirability bias. However, this effect may have been minimized since participants had no incentive to overestimate or downplay their experiences. Also, the findings are limited to children orphaned due to HIV/AIDS, who live with at least one adult caregiver and attend school in a rural setting. Results cannot be generalizable to out-of-school children, non-orphans or those living in urban settings. Finally, our model fit values explained small variances in the outcome variables.

Implications

This study specifically examined the structural dimensions of social of support. Study findings point to family cohesion and perceived social support, especially from caregivers and teachers as important predictors of better children's psychological outcomes. Findings suggest that strategies that strengthen the support and caring for orphaned children, especially in HIV-impact communities in SSA, must strengthen family relationships over and above material support to offset children's psychological wellbeing.

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Table 1.

Baseline characteristics of the sample (N = 346)

Socio-demographic Variables	n (%)
<i>Participant's characteristics</i>	
Age (Range 10–17) (Mean, SE)	13.38 (.12)
Gender	
Female	225 (65)
Male	121 (35)
<i>Orphanhood status</i>	
Single orphan (One parent deceased)	242 (70)
Double orphan (Both parents deceased)	104 (30)
<i>Household Characteristics</i>	
Primary caregiver	
Biological parent	123 (35.6)
Grandparents	98 (28.3)
Other relatives (aunt, uncle, siblings, etc.)	125 (36.1)
No. of children in the Household (Range: 1–9) (Mean, SE)	3.31 (.11)
No. of people in the Household (Range: 1–12) (Mean, SE)	6.46 (.11)
<i>Measures of Perceived Social support (PSS)</i>	
PSS total score (Range: 64 – 120) (Mean, SE)	91.36 (.61)
PSS parent/guardian (Range: 11–30) (Mean, SE)	24.08 (.21)
PSS Teacher (Range: 14–30) (Mean, SE)	23.30 (.20)
PSS Friend (Range:10–30)	21.88 (.21)
PSS Classmate (Range: 8–30) (Mean, SE)	22.10 (.20)
Family Cohesion (Range: 15–40) (Mean, SE)	32.73 (.26)
<i>Measures of Psychological wellbeing</i>	
Depression (Range: 29.01–82.42) (Mean, SE)	50 (.54)
Hopelessness (Range: 32.88–80.85) (Mean, SE)	50 (.54)
Self-Concept (Range: 21.39–70.37) (Mean, SE)	50 (.54)

Table 2.

Itemized description of PSS from multiple sources and family cohesion: (N = 346)

Social support from multiple sources	Mean (SE)
PSS: Parent/guardian	
Some kids have parents/guardians who don't really understand them.	3.75(.07)
Some kids have parents who don't seem to want to hear about their children's problems.	3.78(.07)
Some kids have parents who care about their feelings.	4.24(.06)
Some kids have parents who treat their children like a person who really matters.	4.42(.05)
Some kids have parents who like them the way they are.	4.24(.06)
Some kids have parents who don't act like what their children do is important	3.64(.07)
PSS: Teacher	
Some kids have a teacher who helps them if they are upset and have a problem.	3.99(.06)
Some kids don't have a teacher who helps them to do their very best.	3.58(.07)
Some kids do have a teacher who cares about them.	4.19(.06)
Some kids don't have a teacher who is fair to them.	3.68(.07)
Some kids don't have a teacher who cares if they feel bad.	3.63(.07)
Some kids have a teacher who treats them like a person.	4.23(.05)
PSS: Friend	
Some kids have a close friend who they can tell problems to.	3.88(.02)
Some kids have a close friend who really understands them.	3.91(.06)
Some kids have a close friend who they can talk to about things that bother them.	3.83(.06)
Some kids don't have a close friend who they like to spend time with.	3.49(.07)
Some kids don't have a close friend who really listens to what they say.	3.36(.07)
Some kids don't have a close friend who cares about their feelings.	3.40(.08)
PSS: Classmate	
Some kids have classmates who like them the way they are.	3.66(.07)
Some kids have classmates that they can become friends with.	3.99(.06)
Some kids have classmates who sometimes make fun of them.	3.36(.07)
Some kids have classmates who pay attention to what they say.	3.49(.06)
Some kids don't get asked to play games with classmates very often.	3.36(.07)
Some kids often spend recess being alone.	3.40(.07)
Family Cohesion	
Do your family members ask each other for help before asking nonfamily members?	3.98(.06)
Do your family members like to spend free time with each other?	3.86(.07)
Do your family members feel close to each other?	4.10(.06)
Are you available when others in the family want to talk to you?	3.91(.07)
Do you listen to what other family members have to say, even when you disagree?	4.17(.06)
We do things together as a family.	4.31(.05)
Do your parents take time to listen to you when you want to talk to them?	4.13(.06)
If you have a problem, how often do your parents offer to help?	4.27(.05)

Table 3.

Three regression models showing variations in PSS from multiple sources and family cohesion by socio-demographic characteristics

Variable	Model 1				Model 2	Model 3
	PSS: Parent/ guardian	PSS: Teacher	PSS: Friend	PSS: Classmate	PSS total score	Family Cohesion
	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)
Age	-.14(-.47, .19)	-.10(-.43, .23)	.18(-.18, .52)	.09(-.25, .42)	.02(-.97, 1.0)	-.21(-.63, .22)
Gender: Female	1.7(.89, 2.6) ***	.81(-.03, 1.6)	.56(-.32, 1.4)	.92(.07, 1.8) *	4.0(1.5, 6.5) **	-.74(-1.8, .33)
Orphanhood status: Double orphan	.33(-.66, 1.3)	.66(-.35, 1.7)	-.85(-1.9, .20)	.24(-.78, 1.3)	.37(-2.7, 3.4)	1.7(.41, 2.98) *
Primary caregiver: Biological parents	1.1(.12, 1.99) *	.40(-.55, 1.4)	-.60 (-1.6, .40)	-.003(-.97, .96)	.85(-2.0, 3.7)	.78(-.43, 2.0)
No. of children in the household	.45(.03, .87) *	.40(-.03, .82)	.27(-.17, .72)	.14 (-.29, .58)	1.3(-.02, 2.6)	-.71(-1.3, -.17) *
No. of people in the household	-.21(-.57, .15)	-.30 (-.66, .06)	-.14 (-.52, .24)	-.16(-.52, .21)	-.80 (-1.9, .28)	.52(.062, .99) *
Adjusted R ²	0.0785 ***	0.0252	0.0212	0.0155	0.0396 *	0.0446 *

* p .05

** p .01

*** p .001

Table 4.

Two regression models with three psychological well-being outcomes

Variable	Model 1			Model 2		
	Depression	Self-Concept	Hopelessness	Depression	Self-Concept	Hopelessness
	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)
PSS: total score	-.13(-.23, -.03) **	.32(.23, .41) ***	-.19 (-.29, -.09) ***	--	---	---
Family Cohesion	-.36(-.59, -.13) **	.37(.15, .58) ***	-.11(-.35, .12)	-.33(-.57, -.10) **	.36(.15, .57) **	-.08(-.32, .15)
PSS: Parent/ guardian				-.26 (-.59, .07)	.58(.28, .89) ***	-.63(-.96, -.30) ***
PSS: Teacher				-.32(-.64, .01)	.56(.26, .86) ***	-.10(-.42, .22)
PSS: Friends				.15(-.16, .46)	.23 (-.06, .51)	-.14(-.46, .17)
PSS: Classmates				-.13(-.47, .21)	-.05(.15, -.36)	.05(-.36, .27)
Adjusted R ²	0.075 **	0.211 ***	0.070 **	0.088 **	0.234 ***	0.091 **

All models controlled for participants' age, gender, orphanhood status, primary caregiver, household composition, household wealth and the intervention. None of the socio-demographic variables were statistically significant

*
p .05

**
p .01

p .001