



Published in final edited form as:

*Community Ment Health J.* 2010 February ; 46(1): 33–43. doi:10.1007/s10597-009-9201-z.

## Perceived Social Support and Psychosocial Distress Among Children Affected by AIDS in China

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### Abstract

The psychosocial wellbeing of the children affected by Acquired Immune Deficiency Syndrome (AIDS) receives growing international attention. However, limited data in this area are available in China, which hosts an estimate of 100,000 AIDS-orphaned children. The study aims to examine the relationship between perceived social support (PSS) and psychosocial wellbeing among children affected by AIDS. A cross-sectional survey was administered to 1,625 children (aged 6–18 years) in Henan Province, an area with a large number of HIV cases due to unhygienic commercial blood/plasma collection. Our sample included 296 double orphans (i.e., children who lost both parents to AIDS), 459 single orphans (children who lost one parent to AIDS), 466 vulnerable children (children living with HIV-infected parents) and 404 comparison children (children who did not experience HIV-related illness and death in family). Data suggest that vulnerable children reported the lowest level of PSS compared to AIDS orphans and comparison

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children. Level of PSS was significantly and positively associated with psychosocial wellbeing even after controlling for potential confounders. The study underscores the importance of providing social support and mental health services for children affected by AIDS in China.

### Keywords

HIV/AIDS; Orphans; Vulnerable children; Perceived social support; Psychosocial wellbeing; China

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### Introduction

In the past decade, children affected by HIV/AIDS (e.g., AIDS orphans or vulnerable children) have been identified as a vulnerable population subject to a variety of psychosocial distress (Cluver and Gardner 2007; Li et al. 2008). By 2003, the number of children orphaned by AIDS worldwide was estimated at 15 million, increased by 30% from 11.5 million in 2001. With such a trend, the number could reach 25 million by 2010 and 40 million by 2020 (UNICEF 2004). Although more than 80% of AIDS orphans live in Sub-Saharan Africa, increased attention has been paid to AIDS orphan situations in other developing countries including China, which has experienced a rapid increase of AIDS epidemic in the past two decades (CMOH and WHO 2007). Existing studies on social support and health among children have mainly focused on children with chronic illnesses and in disadvantaged family environment, including children with cancer (Decker 2007), children of divorced parents (Kim 2006; Lusting et al. 1992; Wolchik et al. 1989), and children in foster care (Fettes 2003). However, there is a paucity of data on social support among children affected by AIDS. The current study, using data from China, aims to fill out the literature gap by studying the association between perceived social support and psychosocial wellbeing among a sample of children affected by HIV/AIDS.

Social support has been defined as an exchange of resources between at least two individuals perceived by the provider or recipient to be intended to enhance the wellbeing of the recipient (Shumaker and Brownell 1984). Social support functions in a way that it provides an individual with information that she/he is loved, cared for, esteemed, valued and belonged to a mutually obliging communication network (Cobb 1976). Social support comes from a variety of social interactions, including spouse/partner, colleague, friend, caregiver, and other members of social network or community. Social support exhibits different functions, including emotional support, material support, and informational support (Callaghan and Morrissey 1993). Existing literature suggests that of different functions of support, emotional support is deemed the most important, and has the biggest impact on the recipient's psychological health (Greenwood et al. 1996). Gender and age differences have been observed in perceived social support, and people in different stressful life events may need different social support from different network members (Decker 2007; Vaux 1985; Wellman and Wortley 1989, 1990). There is also a discrepancy between perceived social support and received social support, and only the perceived support has been shown to be consistently linked to health (Haber et al. 2007).

The relationship between social support and psychosocial wellbeing is well established in the literature, dating back to Durkheim (1951). Lack of social support and lower perceived adequacy of social support have been linked to poorer mental and physical health (Allgower et al. 2001; Decker 2007; Vaux 1985). Social support functions as a “buffer” to reduce distress and enhance coping for people in stressful life events (Callaghan and Morrissey 1993). In addition to such psychological effects, physiological processes that link social support and health has been increasingly researched; data indicate that social support can boost immune-mediated process to reduce morbidity and mortality (Uchino 2006). For instance, the well-known Alameda County study in California revealed that people with the lowest social support had 2–4.5 times higher mortality rates than those reporting many social contacts (Berkman and Syme 1979). In a 2-year randomized controlled intervention study among 413 adolescents from 307 families with parental HIV/AIDS, Lee et al. (2007) found that reductions in depression, problem behaviors, and conduct problems among adolescents were significantly associated with better social support from care providers.

In China, the government estimated that there were at least 100,000 AIDS orphans by the end of 2004 (Zhao et al. 2007). Many of the orphans live in Henan Province, an agricultural province in central China with a population of 97 million. From late 1980s to middle 1990s, some governmental and commercial blood stations/centers started collecting blood from poor farmers in rural areas of central China. The unhygienic blood/plasma collection has resulted in a large number of people infected with HIV and other blood-borne diseases. Although such practices were stopped in the late 1990s, many HIV infected individuals progressed to AIDS and subsequently died, leaving their children orphaned (Ji et al. 2007; Zhao et al. 2007). The government initiated some emergency responses to the growing number of AIDS orphans in 2004. The governmental initiatives included building orphanages, establishing group homes (a government-sponsored programs in which volunteers, usually husband and wife, take care of orphans as a family), and providing financial assistance to families taking care of AIDS orphans (Zhao et al. 2007). To date, studies on AIDS orphans in China, particularly regarding their psychosocial wellbeing, have been limited (Li et al. 2008). The existing data indicate that these children have poor mental health, and their psychosocial wellbeing vary by their orphanhood status (Fang et al. 2009; Zhao et al. 2007).

To address the lack of data on psychosocial wellbeing on AIDS orphans in China, particularly the data on perceived social support (PSS), the current study examines the PSS and its association with psychosocial distress/adjustment among children affected by AIDS in Henan Province of China. We use the baseline data of a longitudinal assessment of psychosocial needs of children orphaned or made vulnerable by HIV/AIDS. Our samples include children orphaned by AIDS (AIDS orphans), children living with HIV positive parents (vulnerable children), and children living with healthy parents in the same area (comparison children). We have three hypotheses. First, there is a significant difference in PSS in children by their orphanhood status (AIDS orphans, vulnerable children, and comparison children) and types of orphans (double orphans or single orphans). Second, there is a strong association between PSS and psychosocial adjustment with higher PSS being related to better psychosocial adjustment (i.e., lower depression and loneliness, higher self-esteem and school interest). Third, the association between PSS and psychosocial

adjustment is independent of children's orphanhood status, age, gender and family socioeconomic status (SES).

## Methods

### Study Site

The current study was conducted in 2006–2007 in two rural counties of Henan Province, an agricultural province located in central China with a population of 97 million. A large number of rural residents (mostly farmers) in these two counties were infected with HIV from unhygienic blood/plasma collection from the late 1980s to middle 1990s. Although accurate epidemiological data are lacking, both counties are generally believed to have the highest prevalence of HIV infection in central China (Agence France Presse 2004). The two counties had similar demographic and economic profiles (e.g., both were designated by the central government as “national poverty county”). We obtained village-level HIV surveillance data from each county's anti-epidemic station to identify the villages with highest numbers of HIV infected individuals or HIV-related deaths. The participants in the current study were mainly recruited from five administrative villages (rural administrative units under the county) that had jurisdiction over 111 natural villages.

### Participants

The participants in the current study include 755 AIDS orphans (i.e., children who lost one or both of their parents to HIV/AIDS), 466 vulnerable children (i.e., children living with HIV-infected parents), and 404 comparison children who were from the same community and did not have HIV/AIDS-related illness or death in their families. The AIDS orphan sample includes 176 (23%) orphans living in the government-funded orphanages, 30 (4%) living in community-based small group homes, and 549 (73%) in kinship care. Children 6–18 years of age were eligible to participate in the study. Age eligibility was verified through the local community leaders, school records, or caregivers. Children with HIV infection were eligible to participate, although the number of such children was estimated to be very small and no HIV-test was conducted in the current study.

### Sampling Procedure

The recruitment process for the current study has been described in detail elsewhere (Fang et al. 2009). Briefly, the orphans from centralized care settings were recruited from four government-funded orphanages (2 orphanages in each county) and eight small group homes which had enrolled children at the time of survey in the two counties. A total of 244 AIDS orphans were living in the four AIDS orphanages, among whom 176 (72%) participated in the survey. A total of 43 orphans were living in eight group houses among whom 30 (70%) participated in the survey. To recruit orphans from the kinship care and children living with HIV-infected parents, we worked with the village leaders to generate lists of families caring for orphans or with confirmed diagnosis of parental HIV/AIDS. We approached the families on the lists and recruited one child per family to participate in the assessment. If a child in a selected family was not available to participate, the next family on the list was selected. This process was repeated until the target sample sizes (i.e., about 1,200 in total) for the AIDS orphans and vulnerable children were achieved. A similar approach was employed to recruit

the comparison children (with a target sample size of 400) from the same villages where the orphans and vulnerable children were recruited. The research protocol, including the consenting process, was approved by the Institutional Review Boards at both Wayne State University in the United States and Beijing Normal University in China.

### Survey Procedure

Each child participating in the study completed an assessment survey including detailed measures of demographic information and several scales of psychosocial adjustment. For children with limited literacy, interviewers read each question to them, and the children gave oral responses to the interviewers who recorded the responses in the survey instrument. During the survey, necessary clarification or instruction was provided promptly when needed. The entire assessment inventory took about 75–90 min, depending on the age of the children. Younger children (e.g., those 8 years old) were offered a 10–15 min break after every 30 min of assessment. Each child received a gift at completion of the assessment as a token of appreciation.

### Measures

**Demographic Characteristics**—Children were asked to provide information on their age, gender, ethnicity, perceived health status (very good, good, fair, and poor), parental education (no schooling, elementary school, middle school, high school or more), and parental occupation. A composite score was created to estimate children’s family socioeconomic status (SES) by indexing those children whose parents (father and mother) had more than elementary school education and engaged in non-farming occupation. The SES score had a range of 0–4 with a high score indicating a better family SES.

**Perceived Social Support (PSS)**—*PSS measure* was adapted from the Multi-dimensional Scale of Perceived Social Support (MPSS: Zimet et al. 1988), which has been validated in children and adolescents (Canty-Mitchell and Zimet 2000; Zimet et al. 1990). The original MPSS scale included three subscales assessing the source of the emotional support (i.e., family, friends, or significant others) using a 7-point response option (ranging from 1 = “Very strongly disagree” to 7 = “Very strongly agree”). Considering the potential role of school teachers in supporting children affected by AIDS in rural China, we created a parallel subscale of teacher support using similar questions as other sources of support. Also, considering the young age of these children, we reduced the number of responses from 7-point to 5-point (1 = “Strongly disagree” to 5 = “Strongly agree”) to minimize the potential burden of response for these children. The scale was translated and independently back-translated from English to Chinese and was pilot-tested (along with other assessment scales) prior to the field data collection. The sample questions include “I can talk about my problems with my family”, “I have friends who can share my joys and sorrow”, “I can count on my teachers when things go wrong”, and “There is a special person in my life who cares about my feelings”. Cronbach alpha of the whole scale is 0.88, and the values for the four subscales range from 0.71 to 0.74 (Table 1). A mean score was employed as composite score for the whole PSS scale (16 items) and each of the subscales (4 items each) with a higher score indicating a higher level of perceived support. The mean value of the whole scale is

3.07, and there is a significant gender and age differences in the mean of PSS. Girls and older children reported higher PSS compared to their counterparts.

**Psychosocial Adjustment**—Children provided data on ten psychosocial scales: depression, loneliness, self-esteem, future expectation, hopefulness, perceived control over the future, rule compliance, anxiety, peer social skills and school interest. All the scales were piloted prior to field data collection (along with other scales in our assessment inventory) to examine the reactions of Chinese children to the items and their understanding of measures. The pilot-testing samples ranged from 7 to 16 years of age and included both boys and girls. Following the pilot-testing, no substantive change except for some minor wording modifications were made to improve the comprehensibility of items for younger children. Table 2 lists the ten psychosocial adjustment scales including their sources, number of items, Cronbach alpha, sample questions, and response option for each scale. A mean score (with appropriate reverse coding) was obtained for each of the psychosocial scales as the scale composite score with a higher score indicating a higher level of the perception/behavior the scale intends to measure.

### Statistical Analysis

Statistical analysis was carried out in the following steps. First, the Cronbach alpha of PSS scale and subscales (family support, friends support, teacher support and other support) was calculated for the entire sample and different subsamples. The alpha values were compared across genders and age groups. Using analysis of variance (ANOVA), mean values of the PSS and subscales were compared among different subsamples. Second, ANOVA (for continuous measures) or Chi-square test (for categorical measures) was performed to examine the difference of sample characteristics among three groups of children (AIDS orphans, vulnerable children, and comparison children). Third, ANOVA was employed to compare mean scores of the PSS by orphanhood status (AIDS orphans, vulnerable children, and comparison children), and type of orphans (double orphans and single orphans). Post hoc multiple comparisons were conducted to identify the pair-wise differences of PSS among orphanhood status (three groups) using the one-way ANOVA with the criterion of the least significant difference. Fourth, to assess the association between level of PSS and psychosocial adjustment, we categorized PSS into three levels (i.e., low, medium and high) using 25 and 75 percentile as cut-off. For each of the ten subscales of psychosocial adjustment, the mean values were compared across the three levels of PSS using ANOVA. Finally, multivariate analysis using general linear model (GLM) procedure was performed to examine the unique relationship between PSS and psychosocial adjustment, controlling for children's orphanhood status and other key individual characteristics. The model includes three between-subjects factors: PSS (low, medium and high), orphanhood status (AIDS orphans, vulnerable children, and comparison children), and gender (boys vs. girls). Children's age and family SES (both as continuous variables) were included in the GLM model as covariates. All psychosocial measures were employed as the dependent variables in the GLM analyses. The multivariate significance using Pillai's trace with approximate  $F$  statistic and the univariate ANOVA for each dependent variable were provided from GLM analysis. All analyses were conducted using SPSS for Windows V.16.

## Results

### Demographic Characteristics

As shown in Table 3, the sample in the current study consists of 826 boys (51%) and 799 girls (49%). The mean age was 12.85 years and did not differ between boys and girls (12.89 years vs. 12.82 years,  $F(1,1613) = .404, P = .525$ ). Ninety-nine percent of the children were of Han ethnicity. Two-thirds of the sample considered themselves as having “very good” or “good” health. The majority of the sample (>70%) reported that their father or mother had no more than middle school education. About one-fifth of the children did not know the educational attainment of their parents. The majority of the parents (81% mothers and 66% fathers) worked mainly in farming or worked in cities as rural migrant workers.

There were a number of significant differences in demographic characteristics among the three orphanhood groups. Orphans were older (13.16) than either vulnerable children (12.36) or comparison children (12.83,  $F(2,1613) = 19.24, P < .0001$ ). The proportion of children who did not know their parental education attainment was significantly higher among AIDS orphans (24% for father and 29% for mother) than vulnerable children (14% for each parent) or comparison children (6% for father and 13% for mother) ( $\chi^2(8) = 52.27, P < .0001$  for mother;  $\chi^2(8) = 77.66, P < .0001$  for father). More orphans or vulnerable children reported that their parents mainly engaged in farming than comparison children (i.e., 65 and 58 vs. 41%,  $\chi^2(6) = 39.79, P < .0001$  for father; 80 and 75 vs. 67%,  $\chi^2(6) = 70.77, P < .0001$  for mother).

### Group Differences of PSS Across Sub-samples

We compared the PSS by the orphanhood status and types of orphans. As shown in Table 4, the total value of PSS was highest among the AIDS orphans, lowest in the vulnerable children, and the comparison children were in the middle. Of four subscales of PSS, there is no statistical difference in family support across the three groups of children. However, significant differences were observed in friends support, teachers support and other support. Post hoc comparison revealed that AIDS orphans reported higher level of PSS in these subscales than either vulnerable children or comparison children. There was no significant difference in PSS between double orphans and single orphans except for the subscale of family support, in which single orphans reported higher level of support.

### The Association Between PSS and Psychosocial Adjustment

The ten scales of psychosocial adjustment were compared across the three levels of PSS. As shown in Table 5, nine out of the ten scale of psychosocial adjustment had significant association with levels of PSS, with higher levels of PSS associated with lower levels of psychosocial problems or higher levels of psychosocial wellbeing. Specifically, children with a higher level of PSS reported a lower level of depression and loneliness and a higher level of self-esteem, future expectation, hopefulness, perceived control over future, rule compliance, peer social skills and school interest. Only anxiety was not significantly associated with the level of PSS.

## Multivariate Analysis

In the GLM analysis of PSS and psychosocial adjustment, the level of PSS showed a multivariate significance and univariate significances for nine out of ten psychosocial measures (Table 6). Children's group (AIDS orphans, vulnerable children, and comparison children) showed significance in the multivariate and all univariate tests. Child gender showed significance in multivariate test and five out of ten psychosocial measures. Child age was a significant covariate in multivariate test and seven out of ten psychosocial measures. Children's family SES was a significant covariate in neither multivariate nor univariate test. None of the two-way or three-way interaction terms among factor variables were significant in multivariate or univariate test.

## Discussion

The current study reports the PSS in different groups of children affected by AIDS in rural China. The findings demonstrate the feasibility of measuring PSS and psychosocial adjustment in AIDS orphans in China. The data confirmed the global literature that children affected by HIV/AIDS suffer from psychosocial distress and need strong social support. Our data suggested that PSS was significantly associated with gender and age with boys and younger children reporting a lower level of PSS than their counterparts.

The vulnerable children living with parents with HIV/AIDS reported a lower level of PSS, compared to AIDS orphans. There might be a number of reasons for the difference in level of perceived PSS between AIDS orphans and vulnerable children. First, most of the existing government-sponsored relief efforts have focused on AIDS orphans, particularly double orphans and less attention and support were provided to children living with HIV positive, alive parents. Second, for vulnerable children, parents with HIV might be distracted by their own or spouse's illness and pay less attention/support to children. Third, relatives and friends might focus more on ill parents than on the children in the family, effectively shifting most of the available support to the ill family member at the expense of the children. Fourth, compared to AIDS orphans, the vulnerable children (and other family members) might experience more HIV-related stigma and stigmatization due to ongoing parental HIV infections. Our data suggest the needs to pay particular attention to these children who perceived lower levels of social support and were more vulnerable to psychosocial problems.

Our data also suggested that there were minimal differences in perceived social support between vulnerable children and comparison children. This finding, although somehow unexpected, might be explained by the factor that both vulnerable and comparison children were living in resource-poor rural communities that were largely affected by HIV/AIDS. Stigma associated with both HIV and poverty might also affect the perceived social support among comparison children. However, previous study clearly suggested that vulnerable children had poorer psychosocial adjustment than comparison children (Fang et al. 2009). Future study is needed to explore the complex relationship between perceived social support and psychosocial adjustment among children in socioeconomically disadvantaged environments.



Despite the common belief that double orphans may be more psychologically vulnerable than single orphans and the fact that the Chinese government has paid more attention to double orphans in terms of welfare and social support, our data indicate that there was no significant difference in PSS between double orphans and single orphans except that single orphans reported higher levels of family support (possibly due to the availability of surviving parents for the single orphans). Such findings suggest that both double orphans and single orphans are vulnerable to psychosocial distress and equally need stronger social support.

The current study also found a strong association between PSS and psychosocial distress, which was consistent with global literature on the “buffer” function of PSS. Such strong association underscores the importance of improving social support to alleviate psychosocial distress caused by parents’ infection or deaths due to HIV/AIDS, and improve their children’s psychosocial adjustment. All aspects of social support, including support from family, friends, teachers and significant others are imperative for children affected by HIV/AIDS. Our data also indicated that of the ten scales of psychosocial wellbeing, only anxiety was not significantly associated with level of PSS. The lack of association between anxiety and PSS may be an issue of measurement error and deserves further study.

There were several potential limitations in the current study. First, our samples might not be representative of the children affected by HIV/AIDS in other areas of China. The participants were recruited from one of the regions with high HIV prevalence in China and most of the HIV infected cases in this region were due to unhygienic blood/plasma collection or transfusion. Our sample might not represent children whose parents were infected with HIV via sexual transmission and intravenous drug use. Future studies need to include children from other regions and with other causes of parental HIV. Second, the relationship between PSS and psychosocial adjustment was based on cross-sectional data, which preclude the causal interpretation of the findings. Future research based on longitudinal data is needed to better understand their relationship. Third, some psychosocial measurements in the current study had relatively low reliability estimates (e.g., Cronbach alpha < 0.6 for three of the four CRS subscales). In addition, test-retest reliability data were not available for the psychosocial measurement. Future studies are needed to develop reliable measures that are culturally and developmentally appropriate for rural Chinese children.

Despite these potential limitations, the current study represents one of the first efforts to assess PSS and its association with psychosocial adjustment among children orphaned or made vulnerable by HIV/AIDS. The differences of PSS across age groups, gender, and orphanhood status indicate that the interventions to improve children’s PSS need to be gender and developmentally appropriate and context specific (e.g., orphanhood status). As noted by Woodgate (1999), social support is an ongoing dynamic process. Children of different gender, at different development stages and social conditions may need different forms or levels of social support. Vulnerable children may need more attention and help. The strong association between PSS and psychosocial adjustment exemplifies the importance of social support to alleviate stressful life events and improve psychosocial wellbeing of children affected by HIV/AIDS.

Most literature on social support for children concluded that family support was a primary source of support (Callaghan and Morrissey 1993; Decker 2007). How AIDS orphans obtain social support and cope with distress merit further research. Losing a parent or facing the potential of losing a parent clearly puts a child at risk of psychosocial distress. However, despite these and other substantial risks suffered by the children in this study, some of them did not report elevated level of mental health problems. This was consistent with the existing literature that most children show tremendous resilience in the face of stress (Cicchetti and Curtis 2007). PSS may be one of the resilient factors among these children. Social support is part of a larger cultural context and made up of shared beliefs and customs, and it is these beliefs and customs that inform social interactions between individuals and meanings given to those interactions (Tietjen 1994). How social support functions in the unique social context and close social environment in the rural China deserves further research. For policy makers, it is also important to build social welfare and a support system for families and children affected by AIDS based on local social and cultural context.

The findings in the current study have several implications for mental health promotion efforts and care programs for children affected by AIDS. First, local communities (including local schools) need to improve children's awareness of the availability of social support from various resources including community members, teachers, and peers and encourage them to actively seek such supports. Second, AIDS care programs need to educate caregivers and teachers on ways to effectively provide age and gender appropriate and situation specific support to children. Third, local government and communities need to develop or promote policy and practices for a supportive environment for the communities, families, and children affected by HIV/AIDS.

## Acknowledgments

This study was sponsored by the National Institute of Mental Health and National Institute of Nursing Research (R01MH76488). The content is solely responsibility of the authors and does not necessarily represent the official views of the National Institute of Mental Health and National Institute of Nursing Research. The authors wish to thank other members of the investigation team including Douglas Barnett, Ph.D., Yunfei Lv, Ph.D., Kathryn Meert, M.D., Sylvie Naar-King, Ph.D., and Bonita Stanton, M.D.

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**Table 1**

Cronbach alpha and mean (SD) of perceived social support (PSS) scales

PSS scale	No. of items	Entire sample	Sex		Age group		
			Boys	Girls	<12	12–14	15
<i>Cronbach alpha</i>							
PSS scale	16	.88	.89	.87	.86	.88	.89
Family	4	.73	.74	.71	.70	.74	.72
Friends	4	.71	.71	.71	.64	.70	.75
Teacher	4	.74	.74	.75	.70	.74	.79
Other	4	.71	.69	.72	.68	.71	.67
<i>Mean (SD)</i>							
PSS scale	16	3.07 (.86)	2.99 (.88)	3.16 (.84)****	2.92 (.85)	3.02 (.89)	3.31 (.78)****
Family	4	3.23 (1.04)	3.17 (1.08)	3.30 (1.00)*	3.12 (1.07)	3.15 (1.05)	3.51 (.94)****
Friends	4	2.98 (1.02)	2.89 (1.02)	3.08 (1.00)****	2.82 (.99)	2.91 (1.03)	3.28 (.94)
Teacher	4	2.91 (1.07)	2.87 (1.07)	2.96 (1.06)	2.90 (1.05)	2.90 (1.09)	2.93 (1.03)
Other	4	3.16 (1.08)	3.04 (1.07)	3.29 (1.06)****	2.89 (1.05)	3.12 (1.10)	3.51 (.95)****

\*  $P < .05$ ;

\*\*\*\*  $P < .0001$

**Table 2**

Measures of psychosocial wellbeing

Scale/subscales	No. of items & Cronbach $\alpha$	Content/sample questions	Response option
Center for epidemiological studies depression scale for children (Depression) <sup>a</sup>	20 items, $\alpha = .81$	Depressive symptoms	0 = "not at all" to 3 = "a lot"
Children 's loneliness scale (Loneliness) <sup>b</sup>	16 items, $\alpha = .81$	Perceived loneliness and social dissatisfaction	1 = not at all true to 5 = always true
Self-esteem <sup>c</sup>	10 items, $\alpha = .63$	Global feelings of self-worth or selfacceptance	1 = "disagree a lot" to 4 = "agree a lot"
Children future expectation (Future) <sup>d</sup>	6 items, $\alpha = .84$	Expectations about specific future outcomes in life (e.g., handling problems in life, handling school work, having friends, staying out of trouble, having a happy life, having interesting things to do)	1 = "not at all" to 5 = "very much"
Hopefulness about future (Hope) <sup>e</sup>	4 items, $\alpha = .78$	Hopefulness with regard to some concrete outcomes in the future (e.g., graduation from high school)	1 = "will not happen" to 4 = "will Definitely happen"
Control over the future (Control) <sup>e</sup>	7 items, $\alpha = .63$	Personality-based/dispositional measure relating to perceived control over the future (e.g., "What happens to me in the future mostly depends on me")	1 = "disagree a lot" to 4 = "agree a lot"
Child rating scale <sup>f</sup>	24 items	Contains the following 4 subscales	
Rule compliance/acting out	6 items, $\alpha = .44$	Conduct with regard to typical school and classroom rites "I behave in school", "I follow the class rules"	1 = "usually no" to 3 = "usually yes"
Anxiety/withdrawal	6 items, $\alpha = .62$	Internal reaction to distress (e.g., "I get scared in school," "I worry about things at school").	1 = "usually no" to 3 = "usually yes"
Peer social skills	6 items, $\alpha = .52$	Interpersonal functioning and confidence in dealing with peers (e.g., "I have many friends", "My classmates like me").	1 = "usually no" to 3 = "usually yes"
School interest	6 items, $\alpha = .55$	Interest in school related activities (e.g., "I like to do school work", "I like to answer questions in class").	1 = "usually no" to 3 = "usually yes"

<sup>a</sup> Source: Fendrich et al. (1990) and Wang (1993)

<sup>b</sup> Source: Asher et al. (1984) and Wang (1993)

<sup>c</sup> Source: Rosenberg (1965) and Wang (1993)

<sup>d</sup> Source: Bryan et al. (2005)

<sup>e</sup> Source: Whitkaer et al. (2000)

<sup>f</sup> Source: Hightower (1987)

**Table 3**

Demographic characteristics of three samples

	Overall	AIDS orphans	Vulnerable children	Comparison children
<i>N</i> (%)	1,625 (100%)	755 (47%)	466 (29%)	404 (25%)
Boys	826 (51%)	403 (53%)	219 (47%)	204 (51%)
Girls	799 (49%)	352 (47%)	247 (53%)	200 (50%)
Mean age in years (SD)	12.85 (2.21)	13.13 (2.20)	12.36 (2.24)	12.83 (2.11)*
No. of siblings	1.61 (1.34)	1.58 (1.46)	1.67 (1.36)	1.59 (1.04)
Health				
Very good	464 (30%)	193 (27%)	139 (32%)	132 (33%)
Good	523 (34%)	258 (36%)	146 (33%)	119 (30%)
Fair	499 (32%)	234 (33%)	132 (30%)	133 (34%)
Poor	65 (4%)	34 (5%)	20 (5%)	11 (3%)
Father education*				
No school	41 (3%)	29 (4%)	7 (2%)	5 (1%)
Elementary school	527 (33%)	231 (31%)	175 (38%)	121 (30%)
Middle school	597 (38%)	251 (34%)	166 (36%)	180 (45%)
High school	467 (8%)	49 (7%)	44 (10%)	41 (10%)
Do not know	294 (19%)	177 (24%)	65 (14%)	52 (13%)
Mother education*				
No school	476 (9%)	67 (9%)	52 (12%)	24 (6%)
Elementary school	614 (39%)	238 (33%)	208 (46%)	168 (42%)
Middle school	421 (21%)	177 (25%)	115 (25%)	129 (32%)
High school	70 (5%)	28 (4%)	16 (4%)	26 (7%)
Do not know	318 (20%)	206 (29%)	61 (14%)	51 (13%)
Father occupation*				
Farmer	879 (57%)	462 (65%)	255 (58%)	162 (41%)
Migrant	415 (27%)	146 (21%)	129 (29%)	140 (35%)
Local merchant	131 (9%)	45 (6%)	35 (8%)	51 (13%)
Other	117 (8%)	54 (8%)	21 (5%)	42 (11%)
Mother occupation*				

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	Overall	AIDS orphans	Vulnerable children	Comparison children
Farmer	1,141 (75%)	540 (80%)	335 (75%)	266 (67%)
Migrant	193 (13%)	60 (9%)	73 (16%)	60 (15%)
Local merchant	90 (6%)	32 (5%)	18 (4%)	40 (10%)
Other	95 (6%)	47 (7%)	19 (4%)	29 (7%)

\*  $P < .0001$



**Table 4**

Group differences of PSS scales by children group and orphan type

Orphanhood status	AIDS orphans (1)	Vulnerable children (2)	Comparison children (3)	Post hoc comparison <sup>a</sup>
<i>N</i> (%)	755 (47%)	466 (29%)	404 (25%)	
PSS scale	3.15 (.83)	2.98 (.88)	3.02 (.89)**	(1 > 2)(1 > 3)
Family	3.30 (1.03)	3.19 (1.05)	3.16 (1.03)	
Friends	3.09 (.99)	2.85 (1.03)	2.93 (1.05)****	(1 > 2)(1 > 3)
Teacher	2.99 (1.04)	2.85 (1.10)	2.85 (1.06)*	(1 > 2)
Other	3.24 (1.07)	3.04 (1.05)	3.15 (1.11)**	(1 > 2)

  

Type of orphans	Double orphans	Single orphans
<i>N</i> (%)	296 (30%)	459 (61%)
PSS scale	3.22 (.82)	3.11 (.84)
Family	3.11 (1.07)	3.23 (1.04)*
Friends	3.17 (.97)	3.04 (.99)
Teacher	3.04 (1.04)	2.95 (1.04)
Other	3.28 (1.03)	3.21 (1.09)

\*  $P < .05$ ;

\*\*  $P < .01$ ;

\*\*\*\*  $P < .0001$

<sup>a</sup> Only the pairs that significantly differed at  $P < .05$  are presented in the column

**Table 5**

Association between perceived social support and psychosocial adjustments

	Level of perceived social support			
	Low (bottom 25%)	Medium (middle 50%)	High (top 25%)	N%
Depression	.94 (.43)	.97 (.43)	.85 (.41) *	403 (25%)
Loneliness	2.61 (.69)	2.46 (.67)	2.18 (.72) *	
Self-esteem	2.81 (.38)	2.84 (.42)	3.01 (.43) *	
Future	2.68 (.97)	3.08 (.82)	3.41 (.82) *	
Hope	2.63 (.80)	2.86 (.67)	3.07 (.63) *	
Control	2.84 (.49)	2.98 (.57)	3.13 (.55) *	
Rule compliance	2.29 (.31)	2.38 (.28)	2.42 (.24) *	
Anxiety	1.49 (.42)	1.54 (.42)	1.55 (.44)	
Peer social skills	2.36 (.38)	2.46 (.36)	2.61 (.33) *	
School interest	2.45 (.38)	2.53 (.36)	2.67 (.32) *	

\*  $P < .0001$

**Table 6**  
Results of general linear model: relationship between PSS and psychosocial wellbeing

	Main effect			Covariate		
	Level of PSS <sup>a</sup>	Children group <sup>b</sup>	Gender <sup>c</sup>	Age	Family SES	
Multivariate test <sup>d</sup>	11.87 *****	8.72 *****	6.01 *****	13.51 *****	1.83	
Depression	8.45 *****	34.58 *****	<1	2.07	<1	
Loneliness	31.34 *****	42.68 *****	1.23	28.68 *****	1.09	
Self-esteem	17.64 *****	19.20 *****	<1	9.82 **	1.06	
Future	63.06 *****	3.86 *	4.28 *	12.88 *****	3.34	
Hope	34.09 *****	14.02 *****	5.50 *	4.35 *	3.64	
Control	17.46 *****	9.05 *****	1.67	67.43 *****	2.02	
Rule compliance	15.93 *****	3.49 *	20.40 *****	5.92 *	<1	
Anxiety	1.23	11.45 *****	<1	<1	<1	
Peer social skills	37.29 *****	8.43 *****	22.53 *****	19.11 *****	<1	
School interest	37.27 *****	8.08 *****	8.39 **	2.37	<1	

\*  $P < .05$ ;

\*\*  $P < .01$ ;

\*\*\*\*\*  $P < .0001$

<sup>a</sup>Level of PSS: Low, Medium, High; Please see Tables 4, 5 for the direction of the differences in psychosocial measures

<sup>b</sup>Children Group: AIDS orphans, vulnerable children, and comparison children

<sup>c</sup>Gender: boys vs. girls

<sup>d</sup>All interaction terms were omitted from the table because of the absence of multivariate and univariate significance