Published in final edited form as:

Vulnerable Child Youth Stud. 2012 January 1; 7(3): 249–259. doi:10.1080/17450128.2012.672777.

Parents living with HIV and children's stress and delinquent behaviors in China

Guoping Ji^a, Li Li^{b,*}, Yingying Ding^b, Yongkang Xiao^a, and Junru Tian^b

^aAnhui Provincial Center for Disease Control and Prevention, Hefei, Anhui Province, PR China

^bSemel Institute for Neuroscience and Human Behavior, Center for Community Health, University of California, Los Angeles, CA, USA

Abstract

Objective—The current study aims to explore the association of parents living with HIV (PLHs) and their children's self-esteem, everyday stress, and delinquent behaviors.

Design—The study samples included 79 families with 79 PLHs and 79 children.

Methods—Multiple regression analysis was used on baseline data collected in 2009 from a pilot study in Anhui Province, China.

Results—The results indicated that children from a family with both parents infected with HIV or children from families having multiple children were more likely to report a higher level of everyday stress. Male PLHs have significant influence on their children's everyday stress compared with female PLHs. Children reporting a lower level of parental care and lower self-esteem were significantly more likely to report a higher level of delinquent behaviors. In addition, we have found a strong positive correlation between families with multiple children and their children's delinquent behaviors.

Conclusions—The findings indicate that the severity of psychological and behavioral problems of children living in different HIV-affected families may be dependent not only on factors related to the children but also on factors related to their parents and families. Therefore, parental and family level factors should be considered when providing care and support to children living in HIV-affected families.

Keywords

children; stress; delinquent behaviors; parental; HIV/AIDS; China

Introduction

As the HIV pandemic rate rises worldwide, the number of children affected by parents living with HIV (PLHs) continues to increase (Grassly & Timaeus, 2005; Richter, Beyrer, Kippax, & Heidari, 2010). It has been estimated that about two million children aged 15 or below are living with HIV globally (UNICEF, 2009). As the family capital is lost (Belsey, 2005), the impact of HIV/AIDS is profound not only on PLHs but also on their children (Adato & Bassett, 2009; Kembo, 2010; Richter, 2010; Rotheram-Borus, Flannery, Rice, & Lester, 2005; Schuster et al., 2000; Thorne, Newell, & Peckham, 1998; Zhao et al., 2009). Previous studies reported the impact on children with psychological stress and behavioral problems

(Atwine, Cantor-Graae, & Bajunirwe, 2005; Ji, Li, Lin, & Sun, 2007; Lee, Detels, Rotheram-Borus, Duan, & Lord, 2007). Children from HIV-affected families reported more internalizing and externalizing problems and demonstrated less social and cognitive competence (Steele, Nelson, & Cole, 2007), more social adjustment and attention problems (Bauman, Camacho, Silver, Hudis, & Draimin, 2002; Esposito et al., 1999), and a higher level of depression (Pilowsky, Zybert, Hsieh, Vlahov, & Susser, 2003). Previous studies have also documented that children living in HIV-affected families had low self-esteem (Lee et al., 2002, 2007), high level of stress (Joseph & Bhatti, 2004; Murphy, Marelich, Armistead, Herbeck, & Payne, 2010), and increased delinquent behaviors (Lee et al., 2007).

There are numerous potential mechanisms by which parental HIV infection may be associated with children's psychosocial adjustment difficulties. In comparison, PLHs had more persistent distress and emotional difficulties (Kagee & Martin, 2010; Tsao, Dobalian, Moreau, & Dobalian, 2004). Therefore, it might become more challenging for PLHs in taking care of their children properly, and children living with PLHs were likely to face more difficulties (Murphy et al., 2010). Children living in HIV-affected families tended to have a weak parent-child bond due to the chronic illness of the parents (Bond et al., 2010; Stein et al., 2000). The weak bonding between PLHs and their children contributed to the risk of children's low self-esteem and conduct problems (Lee et al., 2002). Further, PLHs' adjustment could also affect their children's adjustment (Mellins, Brackis-Cott, Dolezal, & Meyer-Bahlburg, 2005; Usmiani & Daniluk, 1997).

In China, HIV/AIDS has spread dramatically since 1985 when the first AIDS case was identified. There are an estimated 740,000 people living with HIV and most of them are parents (Ministry of Health of the People's Republic of China, 2009). The impact on children is extremely profound in China (Ji et al., 2007; Li et al., 2006; Lin et al., 2010). Several studies conducted in China have examined the impact of parental HIV infection on their children's quality of life and delinquency (Li et al., 2009; Sun, Li, Ji, Lin, & Semaan, 2008; Xu, Wu, Rou, Duan, & Wang, 2010). Families struggle with financial constraints and psychological burdens (Ji et al., 2007). Death of parents during childhood is especially traumatic (Li et al., 2008, 2009). Nevertheless, no studies have investigated children's self-esteem, everyday stress, and delinquent behaviors with their perceived parental care as well as their parents and family characteristics. This study aimed to explore these issues, with the hypothesis that children's perceived parental care play an important role in children's behavioral adjustments.

Methods

Study background

This study uses the baseline data from a pilot study of a family intervention for HIV-affected families. The data were collected in 2009 from three counties in Anhui Province, China, a region where most existing HIV infections (over two-thirds) were caused by paid plasma donations (Wu, Liu, & Detels, 1995, 2001). The spread of HIV through plasma donation primarily occurred in the early 1990s, and many HIV-infected individuals are married and have children currently (Ji, Detels, Wu, & Yin, 2006). Six administrative villages were randomly selected from a pool of 20 villages with at least 25 or more HIV-affected families. In the six villages selected, there were a total of 79 families consented to participate in this study.

Procedures

With the assistance from village health workers, project recruiters approached potential participants by following the standardized scripts to ensure that all ethical issues were

covered and the consent process was executed properly. Initial screenings of PLHs were performed by following the inclusion criteria: (1) confirmation of AIDS diagnosis or HIV+ status and (2) at least one child aged 6–18 years living in a family with PLH participants. After receiving a full disclosure of information and a complete description of the study, PLHs who agreed to participate signed the institutional review board-approved informed consents. All children were contacted after obtaining informed consent from the PLH participants with permission to contact their children. The children were informed of their ethical rights, including the right to refuse and withdrawal. They were also informed that their participation in this study was completely voluntary and whether to participate or not would not affect their parents' care or services. Following the informed consent process, face-to-face interviews were conducted either at participants' homes or at other preferred places such as the village clinic. Each interview took about 45–60 minutes. For each assessment, PLH participants were paid with 50 yuan (USD 8.00) and children were paid with 30 yuan (USD 4.50).

In the study, PLH participants' information such as socio-demographics, spouses' HIV status, number of children, and status of mental health was collected. In addition, children's information such as demographics and variables assessing their perceived parental care, self-esteem, everyday stress, and delinquent behaviors was also collected. A total of 158 participants from 79 families, including 79 PLHs and 79 children, participated in the study.

Measures

Mental health was assessed by the MOS-HIV health distress subscale, consisting of four items (Briongos-Figuero, Bachiller-Luque, Palacios-Martín, De Luis-Román, & Eiros-Bouza, 2011; Li et al., 2010; Revicki, Sorensen, & Wu, 1998; Wu, Revicki, Jacobson, & Malitz, 1997). PLHs were asked to rate their level of distress in the past month (1 =all of the time to 6 =none of the time): (1) How much of the time were you a nervous person?; (2) How much of the time you felt calm and peaceful?; (3) How much of the time you felt downhearted and blue?; and (4) How much of the time you felt down in the dumps that nothing could cheer you up? Some items were reverse-coded so that the higher scores indicated better mental health. Cronbach's alpha value for this scale was 0.83.

Parental care was assessed by an adapted version of the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979). The original scale is a 25-item inventory that asks respondents to rate attitudes and behaviors of their parents in terms of two dimensions: care and overprotection. The psychometric properties of the PBI have been extensively examined and found to be satisfactory (Enns, Cox, & Clara, 2002; Matheson et al., 2005; Parker et al., 1979). On the basis of study interest and cultural considerations, we included only the care dimension of the PBI to reflect parental warmth and interest in contrast to rejection and indifference. A total of 12 items were used. Some sample questions were: "doesn't have much conversation with me," "shows an understanding of my problems and worries," and "speak to me in a tone that is warm and friendly." For each item, children were asked how likely each statement which they would respond with choices such as "unlikely" or "likely." The scale of parental care was the sum of the scores from the 12 items. Some items were reverse-coded so that the final scores were in the direction that the higher score indicated a high level of parental care. Cronbach's alpha for this scale was 0.66.

Everyday stress for children was assessed by Everyday Stressors Index Adolescent version (ESI-A). The scale has been used in several previous studies, with satisfactory internal consistencies (Charoensuk, 2007; Peden, Rayens, Hall, & Grant, 2004). We adapted 11 questions from the original 25-item ESI taking into consideration the Chinese culture to assess common problems faced by children on a daily basis, including four items that measure family problems, three items that measure problems with friends, and four items

that measure problems with schools. Participants were asked to rate how each problem concerned and worried them every day on a four-point scale ranging from 1 (not at all) to 4 (concerned a great deal). A summary score was computed, from which the higher the score, the more stress they experienced. The Cronbach's alpha in our sample was 0.79.

Self-esteem was assessed with the Rosenberg Self-Esteem Scale (Rosenberg, 1989), through a self-report questionnaire, which consisted of 10 items assessing feelings of self-worth or self-acceptance. This scale has been used in previous studies (MacMaster, Donovan, & MacIntyre, 2002). For each item, participants were asked how true each statement was for them on a four-point Likert scale ranged from "strongly agree" to "strongly disagree." The scale of self-esteem was the sum of all of the 10 items. Some items were reverse-coded so that the higher score indicated a high level of self-esteem. Cronbach's alpha value for this scale was 0.69.

Delinquent behavior was measured by counting the presence (1) or absence (0) of a list of behaviors that were related to withdrawal (e.g., not getting along with other children, like to be alone, refuse to talk, unhappy, sad or depressed, and shy or timid), aggression (e.g., often argues, disobedient at home, throw temper tantrums or have a hot temper, get in many fights, and often screams), and delinquency (destroy things belonging to family or other children, hang around with children who get in trouble, lie or cheat, swear or use obscene language, and disobedient at school). Some items have been used in previous studies (Achenbach & Ruffle, 2000; Sun et al., 2008). In this study, all the 15 items were combined, with a higher score indicating a high level of delinquent behaviors. Cronbach's alpha for this scale was 0.70.

Statistical analysis

All statistical analyses were performed using the SAS 9.2 statistical software package (SAS Institute Inc., Cary, NC, USA). First, descriptive statistics (mean and SD) and frequencies for PLHs and children were summarized for continuous and categorical variables, respectively. Second, we estimated the Pearson's correlations (r): (1) self-esteem with other PLHs' and children's indicators, (2) everyday stress with other PLHs' and children's indicators, and (3) delinquent behaviors with other PLHs' and children's indicators. Third, two separate multiple linear regression models were performed to identify factors independently associated with everyday stress and delinquent behaviors, respectively. For both dependent variables, the first regression models examined the associations with only PLHs' indicators. Then, the second regression models were conducted to further determine the associations of everyday stress and delinquent behaviors with both PLHs' and children's indicators.

Results

Characteristics of study participants

The study sample consisted of 79 PLH participants and 79 children. As shown in Table 1, over half of the PLHs were male (63.3%). The mean age for the PLH participants was about 41 years old. Only 30.4% of the PLH participants received 6 or more years of education. Sixteen percent of the PLH participants have HIV-positive spouses. More than half of the PLHs (55.7%) reported having two or more children in their families. Over half of the children were male (54.2%). The mean age for children was about 13 years old.

Factors correlated with self-esteem, everyday stress, and delinquent behaviors

Correlation coefficients and p -values of children's self-esteem, everyday stress, and delinquent behaviors with other PLHs' and children's indicators are presented in Table 2.

Self-esteem was significantly positively correlated with children's reported parental care ($r = 0.41, p < 0.001$). Other variables correlated with self-esteem but not significantly included children's age ($r = 0.19, p = 0.091$), PLHs' mental health ($r = -0.22, p = 0.051$), and both parents infected with HIV ($r = -0.21, p = 0.063$). Children's everyday stress was significantly associated with PLHs' gender (male vs. female; $r = 0.25, p = 0.026$), both parents infected with HIV ($r = 0.27, p = 0.017$), PLHs' education ($r = -0.24, p = 0.037$), and children's own age ($r = -0.26, p = 0.021$). Children's delinquent behaviors correlated with their reported everyday stress ($r = 0.28, p = 0.014$), self-esteem ($r = -0.35, p = 0.001$), and perceived parental care ($r = -0.46, p < 0.001$). The relationships between delinquent behaviors and both parents infected with HIV ($r = 0.21, p = 0.063$) and having two or more children in the family ($r = 0.22, p = 0.054$) were also observed.

Factors independently associated with everyday stress and delinquent behaviors

Results from multiple regressions of everyday stress and delinquent behaviors are summarized in Table 3. When including only PLHs' indicators, variables significantly associated with everyday stress included PLHs' gender (male vs. female; $b = 4.03, p = 0.007$), year of education ($b = -0.64, p = 0.015$), two or more children in a family ($b = 2.18, p = 0.061$), and both parents infected with HIV ($b = 4.56, p = 0.018$). Children from a family where both parents were infected with HIV or children from families with multiple children were more likely to report a high level of everyday stress. When the children's indicators were added to the model, the direction of aforementioned associations was not changed but all p -values increased. In addition, we found that there were no significant associations of everyday stress with children's age, gender, reported parental care, and self-esteem.

When using only PLHs' indicators included in the model to predict children's delinquent behaviors, no statistically significant association was observed. It should be noted that, however, there was a strong positive association between having two or more children in the family and children's delinquent behaviors ($b = 0.81, p = 0.061$). When children's indicators were added to model 2, we found that children's reported parental care ($b = -0.44, p = 0.003$) and self-esteem ($b = -0.15, p = 0.039$) were significantly associated with delinquent behaviors.

Discussion

Previous studies have indicated that children were vulnerable for development disruptions when a parent became chronically ill and was under emotional distress (Bauman et al., 2002; Keypour, Arman, & Maracy, 2011). In this study, we found that children's self-esteem, everyday stress, and delinquent behaviors were related to families with both HIV-infected parents. In the families with both HIV-infected parents, children face more challenges in dealing with insecurity, financial difficulties, and discrimination associated with HIV, which could lead to worries and pressure for family responsibilities. Children living in such families may also lack family affection and care necessary for their well-being, which increased the risk to develop psychological and behavioral problems (Fang et al., 2009; Wild, 2002). These challenges became serious for children in the families with both HIV-infected parents, as they are often deprived of capable adult caregivers. The finding has suggested that special attention is needed for children living with both HIV-infected parents.

Parental care is important to children's behavioral adjustment and mental health. As anticipated, there are significant correlations between parental care and children's self-esteem and delinquent behaviors. A recent study indicated that HIV-infected mothers were often more stressed in their parental roles and exhibited poorer parental skills (Murphy et al., 2010). The poorer parental skills led to poor quality of parental care, and this was the underlying mechanism for children's problematic behaviors in association with parental HIV

infection (Murphy et al., 2010). Poor parental care also weakened parent–child bonding, which played an important role in children’s psychological development. Children often imitate and model their parents’ behaviors (Jones, 2007; Ohene, Ireland, McNeely, & Borowsky, 2006). The HIV-affected parents’ self-esteem (Murphy, Marelich, & Amaro, 2009; Usmiani & Daniluk, 1997) and psychological adjustment (Lee et al., 2002), in particular, affected their children’s self-esteem and psychological adjustment. All factors mentioned above significantly attributed to children’s behavioral problems such as low self-esteem and delinquency. A family is the primary origin of the behavior patterns and the basic unit of care for children. Thus, family-centered intervention programs have the potential to help families and children to fight against the negative impact of global HIV epidemics.

We found that some PLHs’ indicators such as gender and education were associated with children’s everyday stress. In contrast to the previous studies (Cederfjäll, Langius-Eklo, Lidman, & Wredling, 2001), we found that male PLHs had significant influence on their children’s everyday stress compared with female PLHs. This might indicate the crucial role of fathers in family lives and family structures. In poor rural areas, males are usually the breadwinners and bear the primary responsibilities of the whole family. A family will experience serious economic distress with male HIV-affected parents and a family’s ability to maintain normal family functions will diminish, suggesting the important role of fathers in children’s well-being (Sherr, 2010). PLHs with higher education might have more resources to better deal with the challenges and give their children a better family environment. The study indicated that children’s everyday stress was increased in families with both HIV-affected parents and in families with two or more children.

Several potential limitations should be noted. First, the sample sizes were not large enough to solidly identify some relationships. Second, the dependence on self-reported measures may cause possible information bias. Third, the cross-sectional design of the study prevents the establishment of causality; for example, we cannot determine the causal direction between parental care and delinquent behaviors. Fourth, there could be some other unmeasured potential factors correlated with children’s stress and delinquency. Fifth, since the Everyday Stressors Index used in this study had not been previously validated with young children, conclusions based on the instrument should be made with caution. In addition, the study was conducted in a rural area where a large proportion of HIV infections were caused by former plasma donations and most PLH participants were farmers, with low levels of education and family income (Ding, Li, & Ji, 2011). The challenges faced by children living in these families may differ from those living in urban areas of China.

The findings of this study support the importance of improving parental care to enhance children’s psychosocial health and children’s behavior adjustment impacted by parental HIV infection. The findings suggest that the severity of psychological and behavioral problems of children living in different HIV-affected families may be dependent not only on children’s own factors but also on their parental and family level factors. Therefore, parental and family level factors should be considered when providing care and support to children living in HIV-affected families.

Acknowledgments

This study was funded by National Institute of Mental Health grant number R01MH080606. The authors thank the project team members in China for their contributions to this study.

References

- Achenbach TM, Ruffle TM. The Child Behavior Checklist and related forms for assessing behavioral/emotional problems and competencies. *Pediatrics in Review*. 2000; 21:265–271. [PubMed: 10922023]
- Adato M, Bassett L. Social protection to support vulnerable children and families: The potential of cash transfers to protect education, health and nutrition. *AIDS Care*. 2009; 21:60–75. [PubMed: 22380980]
- Atwine B, Cantor-Graae E, Bajunirwe F. Psychological distress among AIDS orphans in rural Uganda. *Social Science & Medicine*. 2005; 61:555–564. [PubMed: 15899315]
- Bauman LJ, Camacho S, Silver EJ, Hudis J, Draimin B. Behavioral problems in school-aged children of mothers with HIV/AIDS. *Clinical Child Psychology and Psychiatry*. 2002; 7(1):39–54.
- Belsey, M. *AIDS and the family: Policy option for a crisis in family capital*. New York: United Nations Publications; 2005.
- Bond V, Chilikwela L, Simwinga M, Reade Z, Ayles H, Godfrey-Faussett P, Hunleth J. Children's role in enhanced case finding in Zambia. *International Journal of Tuberculosis and Lung Disease*. 2010; 14(10):1280–1287. [PubMed: 20843419]
- Briongos-Figuero LS, Bachiller-Luque P, Palacios-Martín T, De Luis-Román D, Eiros-Bouza JM. Depression and health related quality of life among HIV-infected people. *European Review for Medical and Pharmacological Sciences*. 2011; 15(8):855–862. [PubMed: 21845794]
- Cederfjäll C, Langius-Eklo FA, Lidman K, Wredling R. Gender differences in perceived health-related quality of life among patients with HIV infection. *AIDS Patient Care and STDs*. 2001; 15:31–39. [PubMed: 11177586]
- Charoensuk S. Negative thinking: A key factor in depressive symptoms in Thai adolescents. *Issues in Mental Health Nursing*. 2007; 28:55–74. [PubMed: 17130007]
- Ding Y, Li L, Ji G. HIV disclosure in rural China: Predictors and relationship to access to care. *AIDS Care*. 2011; 23:1059–1066. [PubMed: 21480006]
- Enns MW, Cox BJ, Clara I. Parental bonding and adult psychopathology: Results from the US National Comorbidity Survey. *Psychological Medicine*. 2002; 32:997–1008. [PubMed: 12214798]
- Esposito S, Musetti L, Musetti MC, Tornaghi R, Corbella S, Massironi E, Principi N. Behavioral and psychological disorders in uninfected children aged 6 to 11 years born to human immunodeficiency virus-seropositive mothers. *Journal of Developmental & Behavioral Pediatrics*. 1999; 20:411–417. [PubMed: 10608370]
- Fang X, Li X, Stanton B, Yan Hong Y, Zhang L, Zhao G, Lin D. Parental HIV/AIDS and psychosocial adjustment among rural Chinese children. *Journal of Pediatric Psychology*. 2009; 34(10):1053–1062. [PubMed: 19208701]
- Grassly NC, Timaues IM. Methods to estimate the number of orphans as a result of AIDS and other causes in Sub-Saharan Africa. *Journal of Acquired Immune Deficiency Syndrome*. 2005; 39(3):365–375.
- Ji G, Detels R, Wu Z, Yin Y. Correlates of HIV infection among former blood/plasma donors in rural China. *AIDS*. 2006; 20:585–591. [PubMed: 16470123]
- Ji G, Li L, Lin C, Sun S. The impact of HIV/AIDS on families and children – A study in China. *AIDS*. 2007; 21(Suppl 8):S157–S161. [PubMed: 18172385]
- Jones SS. Imitation in infancy: The development of mimicry. *Psychological Science*. 2007; 18(7):593–599. [PubMed: 17614867]
- Joseph EB, Bhatti RS. Psychological problems and coping patterns of HIV seropositive wives of men with HIV/AIDS. *Social Work in Health Care*. 2004; 39:29–47. [PubMed: 15774383]
- Kagee A, Martin L. Symptoms of depression and anxiety among a sample of South African patients living with HIV. *AIDS Care*. 2010; 22(2):159–165. [PubMed: 20390494]
- Kembo J. Social and economic consequences of HIV and AIDS on children: Case study of a high-density community in Harare, Zimbabwe. *Journal of Social Aspects of HIV/AIDS*. 2010; 7(4):39–46. [PubMed: 21409310]
- Keypour M, Arman S, Maracy MR. The effectiveness of cognitive behavioral stress management training on mental health, social interaction and family function in adolescents of families with

- one Human Immunodeficiency Virus (HIV) positive member. *Journal of Research in Medical Sciences*. 2011; 16(6):741–749. [PubMed: 22091302]
- Lee MB, Lester P, Rotheram-Borus MJ. The relationship between adjustment of mothers with HIV and their adolescent daughters. *Clinical Child Psychology and Psychiatry*. 2002; 7:71–84.
- Lee SJ, Detels R, Rotheram-Borus MJ, Duan N, Lord L. Depression and social support among HIV-affected adolescents. *AIDS Patient Care and STDs*. 2007; 21:409–417. [PubMed: 17594250]
- Li L, Lee SJ, Jiraphongsa C, Khumtong S, Iamsirithaworn S, Thammawijaya P, Rotheram-Borus MJ. Improving the health and mental health of people living with HIV/AIDS: 12-month assessment of a behavioral intervention in Thailand. *American Journal of Public Health*. 2010; 100(12):2418–2425. [PubMed: 20966372]
- Li L, Wu S, Wu Z, Sun S, Cui H, Jia M. Understanding family support for people living with HIV/AIDS in Yunnan, China. *AIDS and Behavior*. 2006; 10:509–517. [PubMed: 16741672]
- Li X, Fang X, Stanton B, Zhao G, Lin X, Zhao J, Chen X. Psychometric evaluation of the Trauma Symptoms Checklist for Children (TSCC) among children affected by HIV/AIDS in China. *AIDS Care*. 2009; 21:261–270. [PubMed: 19280403]
- Li X, Naar-King S, Barnett D, Stanton B, Fang X, Thurston C. A developmental psychopathology framework of the psychosocial needs of children orphaned by HIV/AIDS. *Journal of the Association of Nurses in AIDS Care*. 2008; 19:147–157. [PubMed: 18328965]
- Lin X, Zhao G, Li X, Stanton B, Zhang L, Hong Y, Fang X. Perceived HIV stigma among children in a high HIV-prevalence area in central China: Beyond the parental HIV-related illness and death. *AIDS Care*. 2010; 15:1–11.
- MacMaster K, Donovan LA, MacIntyre PD. The effects of being diagnosed with a learning disability on children. *Child Study Journal*. 2002; 32(2):101–108.
- Matheson K, Kelly O, Cole B, Tannenbaum B, Dodd C, Anisman H. Parental bonding and depressive affect: The mediating role of coping resources. *British Journal of Social Psychology*. 2005; 44(3): 371–395. [PubMed: 16238845]
- Mellins CA, Brackis-Cott E, Dolezal C, Meyer-Bahlburg HF. Behavioral risk in early adolescents with HIV+ mothers. *Journal of Adolescent Health*. 2005; 36(4):342–351. [PubMed: 15780790]
- Ministry of Health of the People's Republic of China. China 2010 UNGASS country progress report (2008–2009). 2010. Retrieved June 10, 2011 from http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/2010progressreportsubmittedbycountries/china_2010_country_progress_report_en.pdf
- Murphy DA, Marelich WD, Amaro H. Maternal HIV/AIDS and adolescent depression: A covariance structure analysis of the 'Parents and Adolescents Coping Together' (PACT) model. *Vulnerable Children and Youth Studies*. 2009; 4(1):67–82. [PubMed: 20209025]
- Murphy DA, Marelich WD, Armistead L, Herbeck DM, Payne DL. Anxiety/stress among mothers living with HIV: Effects on parenting skills and child outcomes. *AIDS Care*. 2010; 22:1449–1458. [PubMed: 20824552]
- Ohene S, Ireland M, McNeely C, Borowsky IW. Parental expectations, physical punishment, and violence among adolescents who score positive on a psychosocial screening test in primary care. *Pediatrics*. 2006; 117:441–447. [PubMed: 16452364]
- Parker G, Tupling H, Brown LB. A parental bonding instrument. *British Journal of Medical Psychology*. 1979; 52:1–10.
- Peden AR, Rayens MK, Hall LA, Grant E. Negative thinking and the mental health of low-income single mothers. *Journal of Nursing Scholarship*. 2004; 36:337–344. [PubMed: 15636414]
- Pilowsky DJ, Zybert PA, Hsieh PW, Vlahov D, Susser E. Children of HIV-positive drug-using parents. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2003; 42(8):950–956. [PubMed: 12874497]
- Revicki D, Sorensen S, Wu AW. Reliability and validity of physical health and mental health summary scores from the MOS HIV Health Survey. *Medical Care*. 1998; 36:126–137. [PubMed: 9475468]
- Richter L. An introduction to family-centered services for children affected by HIV and AIDS. *Journal of the International AIDS Society*. 2010; 13(Suppl 2):S1. [PubMed: 20573283]

- Richter L, Beyrer C, Kippax S, Heidari S. Visioning services for children affected by HIV and AIDS through a family lens. *Journal of the International AIDS Society*. 2010; 13(Suppl 2):I1–I3. [PubMed: 20573282]
- Rosenberg, M. Rosenberg Self-Esteem Scale manual. Windsor: NFER-Nelson Publishing Company; 1989.
- Rotheram-Borus MJ, Flannery D, Rice E, Lester P. Families living with HIV. *AIDS Care*. 2005; 17:978–987. [PubMed: 16176894]
- Schuster MA, Kanouse DE, Morton SC, Bozzette SA, Miu A, Scott GB, Shapiro MF. HIV-infected parents and their children in the United States. *American Journal of Public Health*. 2000; 90:1074–1081. [PubMed: 10897185]
- Sherr L. Father and HIV: Considerations for families. *Journal of the International AIDS Society*. 2010; 13(Suppl 2):S4. [PubMed: 20573286]
- Steele RG, Nelson TD, Cole BP. Psychosocial functioning of children with AIDS and HIV infection: Review of the literature from a socioecological framework. *Journal of Developmental and Behavioral Pediatrics*. 2007; 28(1):58–69. [PubMed: 17353739]
- Stein D, Williamson DE, Birmaher B, Brent DA, Kaufman J, Dahl RE, Ryan ND. Parent-bonding and family functioning in depressed children and children at high-risk and low risk for future depression. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2000; 39:1387–1395. [PubMed: 11068894]
- Sun S, Li L, Ji G, Lin C, Semaan A. Child behaviour and parenting in HIV/AIDS-affected families in China. *Vulnerable Children and Youth Studies*. 2008; 3:192–202. [PubMed: 19960110]
- Thorne C, Newell ML, Peckham C. Social care of children born to HIV-infected mothers in Europe: European Collaborative Study. *AIDS Care*. 1998; 10:7–16. [PubMed: 9536198]
- Tsao JC, Dobalian A, Moreau C, Dobalian K. Stability of anxiety and depression in a national sample of adults with human immunodeficiency virus. *Journal of Nervous and Mental Disease*. 2004; 192(2):111–118. [PubMed: 14770055]
- UNICEF. Children and AIDS: Fourth stocktaking report. New York: UNICEF, UNAIDS, WHO and UNFPA; 2009. Retrieved June 14, 2011 from http://www.unicef.org/publications/index_51902.html
- Usmiani S, Daniluk J. Mothers and their adolescent daughters: Relationship between self-esteem, gender role identity, and body image. *Journal of Youth and Adolescence*. 1997; 26:45–62.
- Wild J. The psychological adjustment of children orphaned by AIDS. *Southern African Journal of Child and Adolescent Mental Health*. 2002; 13:3–22.
- Wu AW, Revicki DA, Jacobson D, Malitz FE. Evidence for reliability, validity and usefulness of the Medical Outcomes Study HIB Health Survey (MOS-HIV). *Quality of Life Research*. 1997; 6:481–493. [PubMed: 9330549]
- Wu Z, Liu Z, Detels R. HIV-1 infection in commercial plasma donors in China. *Lancet*. 1995; 346:61–62. [PubMed: 7603178]
- Wu Z, Rou K, Detels R. Prevalence of HIV infection among former commercial plasma donors in rural eastern China. *Health Policy and Planning*. 2001; 16:41–46. [PubMed: 11238429]
- Xu T, Wu Z, Rou K, Duan S, Wang H. Quality of life of children living in HIV/AIDS-affected families in rural areas in Yunnan, China. *AIDS Care*. 2010; 22:390–396. [PubMed: 20390520]
- Zhao Q, Li X, Fang X, Stanton B, Zhao G, Zhao J, Zhang L. Life improvement, life satisfaction, and care arrangement among AIDS orphans in rural Henan, China. *Journal of the Association of Nurses in AIDS Care*. 2009; 20(2):122–132. [PubMed: 19286124]

Table 1

Description of study participants.

	No. (%)	Mean $\pm$ SD
<i>PLH</i>		
Age (years)		41.0 $\pm$ 6.6
35 or younger	16 (20.3)	
36–40	22 (27.9)	
41–45	26 (32.9)	
46 or older	15 (19.0)	
Gender		
Male	50 (63.3)	
Female	29 (36.7)	
Year of education		4.6 $\pm$ 2.8
0	11 (13.9)	
1–5	44 (55.7)	
6 or more	24 (30.4)	
Spouse's HIV infection		
Yes	13 (16.5)	
No	66 (83.5)	
Number of children		
One	35 (44.3)	
Two or more	44 (55.7)	
Mental health		14.4 $\pm$ 3.8
<i>Children</i>		
Age (years)		12.7 $\pm$ 3.1
6–12	33 (41.8)	
13–18	46 (58.2)	
Gender		
Male	42 (54.2)	
Female	37 (45.8)	
Parental care		10.2 $\pm$ 1.7
Self-esteem		30.0 $\pm$ 3.7
Everyday stress		26.4 $\pm$ 6.7
Delinquent behavior		2.4 $\pm$ 2.3

Table 2

Correlation coefficients and *p*-values among selected variables.

	Self-esteem		Everyday stress		Delinquent behaviors	
	Correlation coefficients	<i>p</i> -Value	Correlation coefficients	<i>p</i> -Value	Correlation coefficients	<i>p</i> -Value
PLH						
Age	-0.14	0.224	0.15	0.202	0.11	0.345
Male	-0.01	0.932	0.25	0.026	0.18	0.108
Year of education	-0.05	0.642	-0.24	0.037	-0.00	0.698
Mental health	-0.22	0.051	0.05	0.690	0.05	0.643
Two or more children	-0.11	0.321	0.12	0.300	0.22	0.054
Spouse HIV ⁺ ^a	-0.21	0.063	0.27	0.017	0.21	0.063
Children						
Age	0.19	0.091	-0.26	0.021	0.03	0.818
Male	-0.10	0.385	-0.01	0.907	0.11	0.322
Parental care	0.41	<0.001	-0.15	0.176	-0.46	<0.001
Self-esteem			-0.09	0.404	-0.35	0.001
Everyday stress					0.28	0.014

Note:

^aBoth parents are infected with HIV.

\$watermark-text

\$watermark-text

\$watermark-text

Table 3
Linear regressions on everyday stress and delinquent behaviors of children of people living with HIV.

	Everyday stress				Delinquent behaviors			
	Model 1		Model 2		Model 1		Model 2	
	Parameter estimate	p-Value	Parameter estimate	p-Value	Parameter estimate	p-Value	Parameter estimate	p-Value
PLH								
Age	0.11	0.297	0.13	0.231	0.04	0.307	-0.00	0.941
Male	4.03	0.007	3.64	0.016	0.85	0.121	0.83	0.102
Year of education	-0.64	0.015	-0.59	0.026	-0.05	0.592	-0.06	0.482
Mental health	-0.09	0.622	-0.05	0.794	0.01	0.946	-0.04	0.524
Two or more children	2.18	0.061	2.03	0.084	0.81	0.061	0.45	0.241
Spouse HIV ⁺ ^a	4.56	0.018	3.79	0.061	0.28	0.688	-0.16	0.811
Children								
Age			-0.38	0.128			0.12	0.128
Male			-0.65	0.642			0.24	0.594
Parental care			-0.49	0.264			-0.44	0.003
Self-esteem			0.09	0.688			-0.15	0.039
Everyday stress							0.07	0.099

Note:

^aBoth parents are infected with HIV.