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## Exploring Coping and Social Support with Gender and Education Among People Living with HIV in China

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### Abstract

Social support promotes positive coping strategies among people living with HIV (PLH); however, little is known about the various aspects of social support and their distinct effects on coping. The present study investigates the specific links between coping and perceived social support with respect to gender and education among PLH. A total of 522 PLH in Anhui, China, participated in an assessment that collected data on demographics, perceived tangible and emotional support, and cognitive and behavioral coping. The assessment was conducted using the computer-assisted personal interviewing method. The data were analyzed using linear mixed models. Emotional support was significantly associated with both cognitive and behavioral coping. Tangible support was significantly associated with behavioral coping but not with emotional coping. Women reported significantly lower levels of emotional support, cognitive coping, and behavioral coping than men did. Significant associations between tangible support and coping were found only among illiterate males. Women living with HIV are in greater need of social support and coping strategies. Future interventions should be gender specific, with targeted support for women with lower education levels to enhance their coping strategies.

### Keywords

HIV; Social support; Coping; Gender; China

### Introduction

People living with HIV (PLH) experience a myriad of psychological and social stressors [1, 2]. Adopting appropriate coping strategies may be an effective mechanism for easing the psychological and social burdens of HIV [3]. Coping occurs when an individual responds to a stressor with social intrinsic methods (cognitive) and/or external support systems

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#### Compliance with Ethical Standards

All procedures were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients.

**Conflict of Interest** All authors declare that there is no conflict of interest.

(behavioral) [4]. Cognitive coping may consist of emotion-focused strategies such as acceptance of an HIV status and positive reframing [5]. Behavioral coping involves action-oriented strategies such as compensation through consumables, support seeking, and adherence to treatment [6].

The literature has thoroughly documented that social support promotes positive coping strategies among PLH [7, 8]. Studies have shown a positive correlation between social support and coping strategies for women living with HIV [9, 10]. Research on the interrelationships between social support and coping strategies have demonstrated that PLH who perceive little or no social support adopt maladaptive coping styles more frequently than individuals who perceive greater support [11]. Social support comprises two dimensions: emotional support and tangible support [12]. Emotional support occurs when one receives warmth, comfort, or understanding in a social context [13]. Tangible support occurs when an individual provides or offers to provide needed goods such as housekeeping or money [14]. However, most research devoted to social support and coping has investigated social support as a single entity. Less attention has been devoted to different aspects of social support and their distinct effects on coping.

Many studies of HIV-related social support and coping have failed to capture the complexity of the role of gender, particularly with respect to understanding how men and women living with HIV utilize social support [15, 16]. Research has indicated that females may be more likely to seek support to manage the stress associated with HIV [17, 18]. However, Gordillo et al. (2009) demonstrated that males benefit from social support more than females do. In addition to social support, gender inequalities have been reported with respect to the use of coping strategies [19, 20]. Women tend to use emotion-focused coping, whereas males tend to employ behavioral coping skills [21]. Furthermore, gender differences in both social support and coping may arise as a result of socio-demographic factors such as educational attainment level [16, 22, 23]. Based on the Social Action Theory, the subcomponents of the larger social environmental systems contextually determine how personal change mechanisms operate [24].

The gendered layering of perceived social support and coping strategies could be further compounded by socio-demographic characteristics, particularly level of education [25–28]. Even though limited studies have directly explored the relationship between educational attainments and coping styles in HIV-positive individuals [29], lower levels of education have been linked to use of avoidant styles of coping in patients with other types of chronic illnesses [30, 31]. Additionally, it has been well recognized that people with higher educational attainment tend to employ more active forms of coping and less avoidant coping [29, 32, 33]. Previous literature also identified that educational level was found to be an important factor for HIV disparities, especially women [25]. Study showed that HIV-positive individuals with more education endorsed lower use of avoidant and self-destructive coping [28].

The study was guided by social action theory that emphasizes social interdependence and its link to personal health, as well as the linkage between social and personal empowerment [24]. The current study explores the PLH's transformation of available social support into

strategies to cope with the disease, taking into account the influences of gender and education. In addition, the investigation seeks to better understand specific dimensions of coping and perceived social support. The findings of this study will advance our understanding of social support and coping for PLH while also addressing gender and socioeconomic disparities in coping strategies and social support for PLH.

## Methods

### Study Sample and Data Collection

This study used the baseline data of a randomized controlled intervention trial that aimed at improving general health and family relationships of HIV-affected families and children. A detailed description of the intervention pilot has been reported previously [34]. The study was conducted in Anhui Province, China. Anhui Province is one of the 10 provinces with the highest rates of HIV in China [15, 16]. Most of the PLH in Anhui were infected with HIV through contaminated commercial plasma/blood donations [35].

The data was collected between late 2011 to early 2013. Four counties in Anhui Province (Lixin, Funan, Yingzhou, and Linquan) were selected because of the concentration of HIV-infected cases in these areas. Within each county, the villages that had a heavy HIV caseload were identified and selected, resulting in a total of 32 villages considered in this study. The recruitment process began at each village clinic because it was where PLH receive routine check-ups and treatment services. Also, village clinic is a non-stigmatized setting to approach potential participants. Village health workers verbally communicated with PLH about the study and distributed printed flyers to potential participants. PLH who demonstrated interest in the study were referred to a study recruiter who met with them individually to assess their eligibility for the study. The eligibility criteria were: (1) participants must be age 18 or over, (2) participants must be residents of one of the selected villages, (3) participants must have a sero-negative family member and children in the family willing to participate in the study, and (4) the PLH's serostatus has been previously disclosed to the family member. For eligible participants, project recruiters explained the study purpose, procedures, confidentiality issues, and potential risks and benefits following a standardized script. All participants provided written informed consent prior to data collection. A total of 522 PLH were recruited. Among those who were eligible, the refusal rate was approximately 5 %.

Following the informed consent procedure, the study participants were surveyed in a private room at the village clinic or at their preferred venue. The approximate duration of each assessment was 45–60 min. The PLH participants received 50 yuan (USD 8.3) for their participation. The assessment was conducted using the computer-assisted personal interviewing (CAPI) method in which the interviewer sits by a computer, asks the participant the questions shown on the screen, and enters the data directly via a keyboard. Approval for this study was obtained from the appropriate institutional review boards.

## Measures

We collected the respondents' demographic information, including their year of birth, gender, educational attainment level, marital status, and annual individual income. Age was computed by subtracting the reported year of birth from the assessment year.

The MOS Social Support Survey (MOS-SSS), a well-established psychological scale, was used to measure perceived social support in this study [36]. The Chinese version MOS-SSS (MOS-SSS-C) has been validated among Chinese and PLH populations in China [37–39]. The study team has previously pilot tested the scale [34]. The original MOS Social Support Survey consists of four sub-scales: emotional support, tangible support, affectionate support, and positive social interaction. Only two subscales (emotional support and tangible support) that were most relevant to the research topics were selected from the original instrument to reduce respondent burden [40]. Ratings were given on a response scale ranging from 1 to 5, with 0 = “none of the time” and 5 = “all of the time.” The participants were asked about their *emotional support* in eight situations, including having “someone you can count on to listen to when you need to talk” and “someone to give you good advice about a crisis.” The responses to the eight statements were summed, with higher scores indicating higher levels of emotional support. Cronbach's alpha ( $\alpha$ ) for the emotional social support scale was 0.86. *Tangible support* was measured using responses to four statements, including having “someone to help you if you were confined to bed” and “someone to take you to the doctor if you needed it.” The overall scale was the sum of the four items, with higher scores indicating higher levels of perceived tangible support ( $\alpha = 0.88$ ).

Coping was measured using an adapted version of the work of Namir and colleagues (1987) that assesses cognitive and behavioral efforts to cope with an illness [41]. The original scale consists of 72 items. In order to minimize survey fatigue and respondent burden [40], we have organized an expert panel locally prior to the data collection to simplify the measures. Cognitive coping and behavioral coping subscales were chosen to be incorporated in this study in consideration of the research interests and relevancy to local participants. Culture relevancy of each item was carefully reviewed and discussed in the panel. Some of the original items, such as “trust my belief in God”, “use self-meditation, self-hypnosis, or imaginary”, and “got involved in political activities related to my illness”, were not relevant in Chinese culture so they were dropped in our survey. The final cognitive coping and behavioral coping subscales both contain seven items. The participants used a five-point scale (1 = never and 5 = always) to respond to the question “Which of these things have you used to help you deal with your illness?” The *cognitive coping* scale that included items such as “thought about the positive changes in me since the illness” and “formed a plan of action in my mind” ( $\alpha = 0.66$ ). *Behavioral coping* subscale that included “went out more socially” and “turned to work or other activities to keep my mind off things” ( $\alpha = 0.75$ ). Higher summed scores indicated higher levels of cognitive/behavioral coping.

## Data Analysis

We first conducted a descriptive analysis of the PLH's demographic characteristics, social support and coping measures. To account for the clustering structure (because the participants were clustered within villages), Cochran–Mantel–Haenszel (CHM) tests were

used to compare demographic characteristics (categorical) between the male and female participants. Next, we used a village-level random-effects model to assess gender difference in each of the social support and coping measures (continuous). To understand whether gender difference in each of these measures differed across education levels, we added the following covariates: gender, education (none, 1–6 years, and 7 or more years), and gender-by-education interaction, to the above model. Third, the unadjusted associations between emotional support, tangible support, cognitive coping and behavioral coping were then estimated using village-level random-effects models. Lastly, to further investigate whether the above associations differed across gender and education level, we used a single modeling approach that included the following factors: three main factors (gender, education, emotional or tangible support), three two-way interaction terms, and one three-way interaction term. All analyses were conducted using SAS 9.4 software (SAS Institute, Cary, NC).

## Results

### Demographic Characteristics of the Study Participants

A total of 522 PLH were included in the study, including 234 (45 %) males. Approximately 40 % of the participants were between 41 and 50 years of age ( $N = 422$ ; 43 %). The average age for males and females was the same, at approximately 48 years of age. The majority of the participants were married or cohabiting at the time of the study (85 % for men and 79 % for women). No significant gender differences in age or marital status were found. Approximately two-fifths of the participants had attained no education ( $N = 210$ ; 40.2 %), and only 13.6 % had attained seven years or more of education. The education level was significantly lower for female participants compared with their male counterparts: 60 % of the females and 16 % of the males had no education ( $p < 0.0001$ ). The average personal annual income was 4213 yuan (approximately 700 USD). Income levels were significantly lower for females, with more than half of the female participants (56 %) compared with one-fifth (20 %) of the male participants reporting less than 2000 yuan in annual income ( $p < 0.0001$ ) (Table 1).

### Gender Differences in Social Support and Coping

Table 2 presents the estimated gender differences in social support and coping measures overall and across education levels. The female participants perceived significantly lower levels of emotional support than did the male participants (15.8 vs. 17.8,  $p < 0.0001$ ); however, both groups reported similar levels of tangible support (12.7 vs. 13.3 for female vs. male,  $p = 0.058$ ). With respect to coping strategies, women scored significantly lower than men in terms of cognitive (17.9 vs. 19.0,  $p = 0.007$ ) and behavioral coping (15.1 vs. 16.7,  $p < 0.0001$ ). When we considered different levels of education, we found male participants had a significantly higher level of emotional support than female participants when the participants had some level of education (18.2 vs. 15.7,  $p = 0.001$ ). No gender differences were observed in the other measures at any education levels. Among female participants, those who had seven or more years of education showed significant higher levels of behavioral coping ( $p = 0.013$ ) and emotional support ( $p = 0.027$ ) than those who had no

education. Similar educational effects on behavioral coping ( $p = 0.024$ ) and emotional support ( $p = 0.002$ ) were observed for male participants.

### Association Between Social Support and Coping

The unadjusted analyses in Fig. 1 indicate that the two types of social support (emotional and tangible support) and two types of coping strategies (emotional and behavioral coping) were positively correlated with one another (0.19 vs. 0.57, respectively;  $p < 0.0001$ ). A higher level of emotional support was significantly associated with higher levels of both cognitive coping and behavioral coping (0.26 vs. 0.36, respectively;  $p < 0.0001$ ). However, tangible support was significantly associated with behavioral coping (0.28,  $p < 0.0001$ ) but not with cognitive coping (0.10,  $p = 0.069$ ).

### Associations Between Social Support and Coping by Gender and Education

Table 3 presents the estimated associations between perceived support and coping across gender and levels of education. Regardless of a participant's education level, we found significant associations between cognitive coping and emotional support for both male participants (range: 0.21–0.32,  $p < 0.05$ ) and female participants (range: 0.18–0.44;  $p < 0.05$ ). However, we observed a significant relationship between cognitive coping and tangible support only for male participants who had not received any education ( $0.43 \pm 0.21$ ,  $p = 0.046$ ). This association was significantly greater for male versus female participants with no education (0.43 vs.  $-0.08$ ,  $p = 0.029$ ). The associations between behavioral coping and emotional support were significant for male participants regardless of their education level (range: 0.24–0.39,  $p < 0.05$ ). We found highly significant associations between behavioral coping and emotional support for women with 6 or fewer years of education (range: 0.24–0.35,  $p < 0.0001$ ). This relationship was not found to be significant for women who had received more than 6 years of education. Similarly, behavioral coping and tangible support were positively correlated for male participants regardless of their educational level (range: 0.29–0.69,  $p < 0.05$ ). The illiterate male participants, defined as those who reported zero year of education, showed a significantly stronger relationship between behavioral coping and tangible support than did the illiterate female participants in the study (0.69 vs. 0.09,  $p = 0.012$ ).

## Discussion

In this study, we explored whether and how male and female PLH differ in regard to perceived social support and coping styles. We found that women reported lower levels of emotional support, cognitive coping, and behavioral coping than their male counterparts did. These findings are inconsistent with existing research reporting that women may be more likely to seek social support than their male counterparts are [17]. This inconsistency may be attributed to various factors, including HIV-related stigma with respect to females living with HIV. Studies specific to HIV-related stigma have documented higher levels of stigma for women than for men because of socio-cultural values such as the low status of women and social solidarity [42, 43]. When a female is diagnosed with HIV, her role as the primary caretaker of the household may be compromised as a result of the demands of HIV care [44]. Females living with HIV may be more likely to experience a heavy caregiver burden



compared with males, resulting in compromised cognitive and behavioral coping [45]. Consistent with this observation, considering the Chinese socio-cultural context is important in this study. Women living with HIV in China may find it difficult to seek social support in a family-centered culture in which emotions are traditionally contained [46, 47]. Women may refrain from disclosing their HIV status or seeking social support in an attempt to maintain family harmony [48, 49]. As such, the social status of women and social stigma against women living with HIV may hinder women from seeking social support and thus jeopardize their ability to cope with the disease.

The results echoed and emphasized the findings from previous studies that have demonstrated a positive association between social support and coping strategies in the U.S. and Africa [7, 8, 16]. In particular, we found that emotional support is strongly associated with both behavioral and cognitive coping, whereas tangible support is only associated with behavioral coping. The positive association may be observed because emotional support may influence PLH to choose positive coping styles. Moreover, emotional support may improve the self-esteem of PLH and thereby encourage PLH to seek positive community interactions.

Gender and educational attainment were found to play a role in coping styles and in the levels of social support, as the results suggest that gender differences in the associations between tangible support and cognitive/behavioral coping declined as educational attainment levels increased. This finding is consistent with previous work demonstrating that educational attainment influences health by improving health knowledge, health behaviors, and psychological factors such as social support [50]. Moreover, education may improve the cognitive and behavioral skills of PLH, which may translate into more informed health-related decision-making. However, we observed significant gender differences among PLH participants who did not have any education; perceived tangible support was associated with coping only for male participants, which is to say, illiterate males could convert the available tangible support to positive coping style while illiterate females might not. One possible explanation for this finding is that female PLH, lacking education and its associated social advantages, are less likely to link the benefits of coping to their perceptions of support. Gender gaps in social support and coping, compounded by a lack of education, place additional burdens on women living with HIV in terms of accessing social support and managing the coping process.

This research has several limitations. First, the cross-sectional research design and analyses do not allow for causal inference between social support and coping. Second, the measures of social support and coping are based on self-reports and the alpha score for cognitive coping scale is relatively low which may limit the validity of the study findings. Additionally, the study was conducted in a region of China that has a unique HIV epidemic. The majority of the study participants were infected through commercial plasma donations, which might limit the generalizability of the study findings. However, the social-cultural context in terms of gender role, gender inequalities in education, and lack of access to social support in women are similar across China. Thus, the findings from this study could be applicable to other regions of China.

In conclusion, our study findings suggest that future interventions to improve support and coping for PLH must be gender oriented in their conception and design. Women living with HIV may require enhanced emotional and tangible support that is adapted to their unique requirements. Given the role of educational attainment, more attention should be devoted to women with lower levels of education and the provision of information at multiple levels of comprehension.

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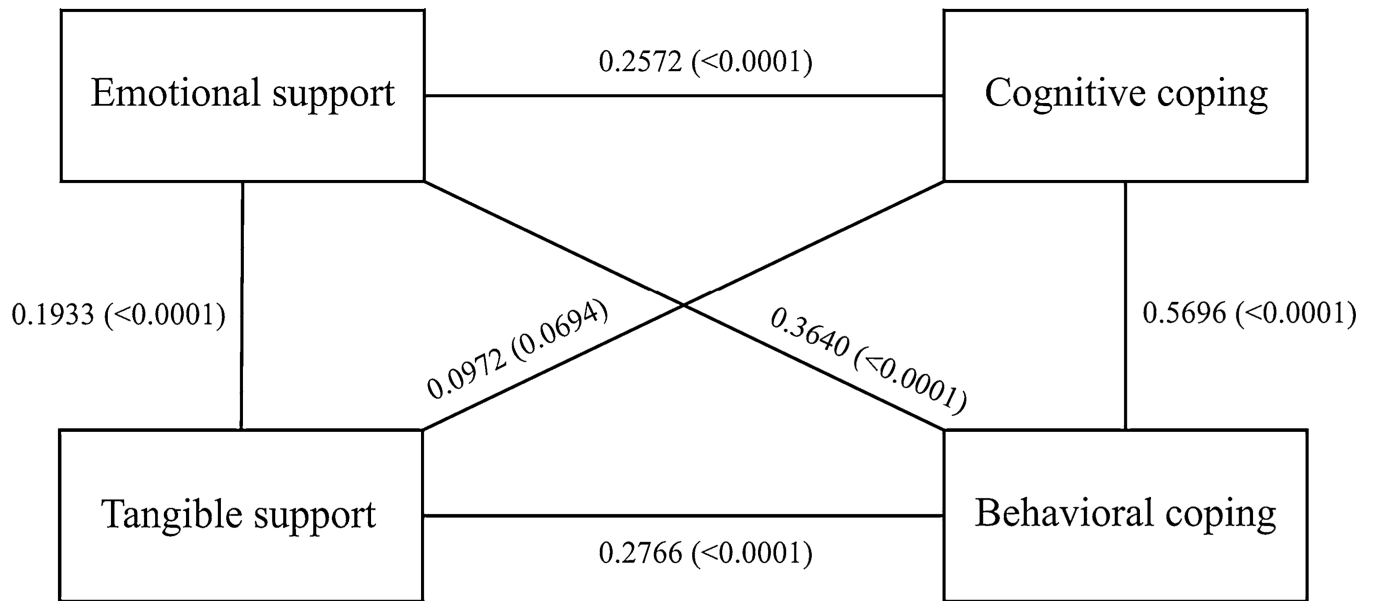
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**Fig. 1.** Associations and *p* values among selected variables. *Note* The associations were examined using village-level random-effects models with no covariates

**Table 1**  
Gender differences in demographic characteristics, coping, and social support ( $N = 522$ )

	Overall		Male		Female		<i>p</i>
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	
Age (years)							0.217
40 or younger	104	19.92	53	22.65	51	17.71	
41–50	222	42.53	100	42.74	122	42.36	
Over 50	196	37.55	81	34.62	115	39.93	
Marital status							0.050
Married or living as married	425	81.42	199	85.04	226	78.47	
Single/separated/divorced/widowed	97	18.58	35	14.96	62	21.53	
Years of education							<0.0001
None	210	40.23	37	15.81	173	60.07	
1–6 years	241	46.17	143	61.11	98	34.03	
7 years or more	71	13.60	54	23.08	17	5.90	
Yearly income (Yuan)							<0.0001
Less than 2000	209	40.04	47	20.09	162	56.25	
2000 to 4000	148	28.35	70	29.91	78	27.08	
More than 4000	165	31.61	117	50.00	48	16.67	

**Table 2**  
Gender difference in support and coping strategies overall, and across education levels (estimated mean and SE)

Education	Emotional support		Tangible support		Cognitive coping		Behavioral Coping		<i>p</i> <sup>a</sup>			
	Est. mean (SE)	<i>p</i> <sup>a</sup>	Male	Female	Est. mean (SE)	<i>p</i> <sup>a</sup>	Male	Female				
Overall	17.83 (0.42)	15.82 (0.39)	<.0001	13.32 (0.29)	12.71 (0.28)	0.058	18.96 (0.33)	17.90 (0.31)	0.007	16.72 (0.34)	15.07 (0.32)	<.0001
Education												
None	15.03 (0.97)	15.55 (0.49)	0.617	13.06 (0.62)	12.93 (0.33)	0.840	17.75 (0.74)	17.64 (0.37)	0.894	15.49 (0.76)	14.56 (0.39)	0.259
1–6 years	18.15* (0.52)	15.73 (0.62)	0.001	13.00 (0.34)	12.25 (0.40)	0.115	19.07 (0.40)	18.27 (0.47)	0.173	16.64 (0.41)	15.49 (0.49)	0.054
7+ years	18.80* (0.81)	18.82* (1.41)	0.993	14.37 (0.52)	13.15 (0.90)	0.227	19.46 (0.62)	18.24 (1.09)	0.325	17.67* (0.64)	17.45* (1.11)	0.865

\* Significant education effect within male or female (*p* < .05); no education was the reference category for within gender comparison

<sup>a</sup> Gender comparison

**Table 3**

Associations between coping and social support by gender and education

Education	Response = cognitive coping						Response = behavioral coping					
	Emotional support			Tangible support (NS)			Emotional support			Tangible support		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
None	0.321	0.119	0.011	0.433	0.209	0.046	0.240	0.116	0.045	0.689	0.210	0.002
Female	0.186	0.061	0.005	-0.075	0.083	0.371	0.271	0.060	<0001	0.089	0.083	0.295
Male-female	0.136	0.133	0.316	0.508	0.223	0.029	-0.031	0.130	0.812	0.600	0.225	0.012
1-6 years	0.211	0.064	0.002	0.102	0.114	0.375	0.354	0.062	<0001	0.289	0.115	0.017
Female	0.266	0.072	0.001	0.187	0.117	0.118	0.432	0.070	<0001	0.374	0.118	0.003
Male-female	-0.056	0.096	0.567	-0.085	0.163	0.607	-0.078	0.094	0.407	-0.085	0.164	0.609
7+ years	0.278	0.078	0.001	0.257	0.180	0.164	0.393	0.076	<0001	0.377	0.182	0.046
Female	0.442	0.186	0.023	0.565	0.529	0.294	0.344	0.180	0.065	0.296	0.534	0.582
Male-female	-0.164	0.201	0.422	-0.308	0.561	0.586	0.049	0.196	0.804	0.080	0.565	0.888