



Published in final edited form as:

*Psychol Health Med.* 2023 ; 28(8): 2300–2314. doi:10.1080/13548506.2023.2198244.

## Intrapersonal predictors of internalized stigma among school going adolescents living with HIV in southwestern Uganda

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### Abstract

We assessed the association between internalized HIV stigma, resilience, health locus of control, coping self-efficacy, and empowerment among adolescents living with HIV in Uganda. We conducted a cross-sectional study between August and October 2020 among 173 adolescents aged 13–18 years attending Mbarara Regional Referral Hospital's HIV clinic. We used linear regression to determine the association between HIV stigma and intrapersonal factors adjusting for sociodemographic characteristics. The median age of participants was 16 (IQR 3) years. There was a negative correlation between HIV stigma and resilience ( $\beta = -0.03$ ,  $p < 0.001$ ), internal health locus of control ( $\beta = -0.095$ ,  $p < 0.001$ ), and coping self-efficacy ( $\beta = -0.02$ ,  $p < 0.001$ ), while empowerment was positively correlated ( $\beta = 0.07$ ,  $p < 0.001$ ) with HIV stigma. After adjusting for the intrapersonal factors (resilience, health locus of control, coping self-efficacy and empowerment), and sociodemographic characteristics (education level and boarding school), only internal health locus of control ( $\beta = -0.044$ ,  $p = 0.016$ ) and coping self-efficacy ( $\beta = -0.015$ ,  $p < 0.001$ ) remained significantly correlated with HIV stigma. The findings suggest that interventions focusing on intrapersonal factors such as internal locus of control, empowerment, and resilience may contribute towards reduction of HIV stigma among adolescents in boarding schools.

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Authors' contributions

JK and SA designed the research, were involved in data collection, carried out data analysis and wrote the manuscript. SM provided guidance in the study design, data analysis and edited the manuscript. BCZ provided guidance in data analysis, interpretation of the study findings and edited the manuscript. AF and DN provided support in the data collection, data analysis and edited the manuscript. All authors read and approved the final manuscript.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Ethical considerations

The study was approved by the research ethics committee of Mbarara University of Science and Technology (# 02/05–20), and all participants provided written informed before they were enrolled in the study.

## Keywords

HIV stigma; resilience; locus of control; self-efficacy; empowerment; Uganda

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## Introduction

There are about 170,000 adolescents and young adults aged 15–24 years living with HIV in Uganda accounting for 12% of the 1.4 million people living with HIV in the country (Ministry of Health, 2021). HIV remains a leading cause of mortality among adolescents in sub Saharan Africa despite viability of antiretroviral therapy (ART) in these settings (UNAIDS, 2018). HIV among adolescents and young adults is often characterized by high rates of loss to follow up, disengagement from care and poor adherence to ART compared to young children and adults (Mekuria et al., 2015; Zanoni et al., 2016). Despite these challenges, HIV care for adolescents has focused more on access to and adherence to ART with little or no attention to the evolving social and psychological needs related to normal development challenges that complicate life with a chronic stigmatized disease (Folayan et al., 2014; Judd et al., 2016).

Many adolescents living with HIV (ALHIV) report experiencing stigma and rejection among their peers and the community (Ashaba et al., 2018; Ashaba et al., 2019; Cervia, 2013), and HIV stigma remains a major barrier to HIV care in this age group affecting ART adherence and retention in care (Martinez et al., 2012; Vreeman et al., 2009). HIV stigma and discrimination also impact access to and enrollment into HIV care among ALHIV due to the fear of rejection and loss of respect among peers (Ashaba et al., 2019; Nabukeera-Barungi et al., 2015). Attending boarding schools (Birungi et al., 2011), where living arrangements may not provide privacy in relation with HIV medications, increases the risk of unintended exposure of adolescents' HIV status and the experiences of HIV stigma (Inzaule et al., 2016; Mutwa et al., 2013). ALHIV in boarding schools may resort to hiding their HIV medications while others may fail to honor their HIV clinic appointments to avoid being identified as living with HIV interfering with their ability to adhere to treatment (Ashaba et al., 2019; McHenry et al., 2017). For others, rigid school routines do not offer the needed flexibility to enable adolescents to take their medicines at designated times (MacCarthy et al., 2018; Zanoni et al., 2019).

Intrapersonal factors like resilience, self-efficacy, health locus of control, and empowerment are known to influence the perception of HIV (Seghatol-Eslami et al., 2017). Self-efficacy has been associated with positive health related outcomes (Steele et al., 2013) and documented as a major factor influencing stigmatization among people with chronic medical conditions (Johnson et al., 2007; McCann et al., 2008). Internal health locus of control (the belief that health is in one's control) has been found to influence quality of life and reduce feelings of stigmatization among people living with HIV (Mostafavian et al., 2018). Additionally, resilience which is the ability of an individual to cope in the presence of adverse situations (Zimmerman, 2013) has been associated with reduced stigma among people living with HIV (Gottert et al., 2019). On the other hand, empowerment which is associated with development of self-efficacy and health locus of control has been noted

to improve resilience (Brodsky & Cattaneo, 2013; Shogren et al., 2014). Improving self-efficacy and internal health locus of control are likely to buffer the effects of internalized HIV stigma and consequently improve ART adherence (Seghatol-Eslami et al., 2017; Turan et al., 2017).

Although multiple studies indicate that coping self-efficacy, resilience, empowerment and health locus of control influence HIV stigma, information on the interaction between these factors among ALHIV is sparse (Denison et al., 2015; McHenry et al., 2017). This is especially crucial for school going adolescents whose living conditions put them at an increased risk of internalized HIV stigma and poor adherence to medicines (Mutwa et al., 2013). Therefore, this study aimed to understand the intrapersonal predictors of internalized HIV stigma among school going ALHIV in southwestern Uganda.

## Methods

### Study setting

We conducted the study at the HIV clinic attached to Mbarara Regional Referral Hospital (MRRH) in Mbarara city. Mbarara city is 270 km from Uganda's capital, Kampala, with a population of 195,013 (Uganda Bureau of Statistics, 2014). The majority of the people who seek care at MRRH HIV clinic reside in rural areas outside of the city where they are engaged in retail trading, subsistence farming, and animal rearing to make a living amidst challenges of water and food scarcity (Mushavi et al., 2020; Tsai et al., 2016). This is consistent with the general demographic trends in Uganda, where the majority of people are under the age of 18 as a result of the nation's high fertility rates. Most of these young people, the majority of whom are female, reside in rural areas, and they attend school (Uganda Bureau of Statistics, 2021). The HIV prevalence in Mbarara has been estimated at 13% among people aged 15–49 years which is higher than the national prevalence of 5.8% (UNAIDS, 2021). The HIV clinic at MRRH and other HIV clinics within other health facilities in Mbarara city offer HIV care services to both adults and children including HIV testing, enrollment on ART and monitoring viral load at no cost.

### Study participants

Between August and October 2020, we recruited 173 adolescents who were aged 13–18 years, fully aware of their HIV status (HIV status fully disclosed to them), attending school, living within 60 km of the HIV clinic, and were willing to provide assent and/or consent to participate in the study. We used purposive sampling to ensure a diverse range of participants (e.g., boarding school vs. day school, older vs. young ALHIV, male vs. female). We excluded ALHIV who were not fully aware of their HIV status, despite accessing care in the HIV clinic; those who were not physically strong enough to stand the length of the questionnaire and those with cognitive impairments that would interfere with their ability to comprehend the consent form and the questionnaire as assessed clinically in consultation with a licensed Ugandan psychiatrist.

## Sampling procedure

We used consecutive sampling technique to recruit participants. Participants were assessed by a clinician in the HIV clinic for eligibility before referring them to the research assistant (RA) for enrollment. Those who met the inclusion criteria were given details about the study by the RA before they provided assent and/or consent to participate in the study. Enrollment was done within the HIV clinics after eligible participants completed all the procedures concerned with HIV care. Interviews were conducted in a private room within the HIV clinic to ensure privacy and confidentiality.

## Data collection

We used an interviewer administered questionnaire to collect information on sociodemographic characteristics including age, sex, level of education, type of school (day versus boarding), and who they lived with. We assessed for food insecurity using a single question (“did you have enough food at home in the past month?”). We also collected information on internalized HIV stigma, resilience, health locus of control, coping self-efficacy, and empowerment using tools described below. The main outcome variable was internalized HIV stigma while the main predictor variables were resilience, health locus of control, coping self-efficacy, and empowerment.

## Study measures

### Internalized AIDS-Related Stigma Scale

Internalized HIV stigma was measured using the internalized AIDS-Related Stigma scale (IARSS), a six-item scale that was created for use in a group of individuals living with HIV from the United States, South Africa, and Eswatini (Kalichman et al., 2009). The IARSS has been used extensively in Uganda (Ashaba et al., 2018; Ashaba et al., 2021; Tsai et al., 2013b) and its items are focused on self-blame and concealing one’s HIV status. Examples of items include “it’s difficult to tell people about my HIV infection” and “I’m ashamed to be HIV positive”. Each question is scored on a binary response scale (agree=0/disagree=1), and the scale’s final score is computed as the sum of the items’ scores, with higher scores indicating greater internalized stigma. The minimum score of the scale is 0 and the maximum score is 6. The scale has been used among ALHIV in the current study setting with a Cronbach’s alpha of 0.75 (Ashaba et al., 2018). The current study the Cronbach’s alpha was 0.73.

### Resilience scale

Resilience was measured using the Resilience Scale (RS-25) (Wagnild & Young, 1993). It is a self-report measure with 25 items, each of which is rated on a 7-point Likert type scale. Five characteristics of resilience are included in the scale: self-reliance, meaning, equanimity, perseverance, and existential aloneness. RS-25 scores range from 25 to 175. Scores greater than 145 indicate moderately high to high resilience, scores from 116 to 144 indicate low to moderate levels of resilience, and scores of 115 and below indicates very low resilience. In this study the scale had a Cronbach’s alpha of 0.95.

### Health locus of control

We measured health locus of control using the 18-item Form C version of the Multi-dimensional Health Locus of Control (MHLC) measure, developed by Wallston (2005). This is a self-report instrument that assesses the extent to which participants believe their health is attributed to: (1) their own behavior (internality); (2) the behavior of powerful others (which in form C is split into two subscales: doctors and others) or (3) chance, luck, or fate. Participants are asked to rate their agreement with each item using a 6-point Likert-type scale (1 = strongly disagree; 6 = strongly agree) and the minimum score is 18 and maximum is 108. In this study the scale had a Cronbach's alpha of 0.75.

### Coping Self-Efficacy scale (CSES)

Coping self-efficacy was measured using the Coping Self-Efficacy scale (CSES;) (Chesney et al., 2006). The CSES measures participants' perceived self-efficacy in coping with psychological challenges and threats. Respondents are asked, "When things aren't going well for you, or when you are having problems, how confident or certain are you that you can do the following?" The questionnaire then lists 13 coping behaviors that include three distinct dimensions of adaptive coping: problem-focused coping (e.g., "Think about one part of the problem at a time"), emotion-focused coping (e.g., "Take your mind off unpleasant thoughts"), and social support (e.g., "Get emotional support from friends and family"). Respondents endorse their confidence in carrying out these behaviors on an 11-point Likert type scale, ranging from 0 ("Cannot do at all") to 5 ("moderately certain can do") to 10 ("certain can do"). The minimum score for this tool is 0 and the maximum is 260 and has been used among adults living with HIV (Johnson et al., 2007). In this study the scale had a Cronbach's alpha of 0.97.

### Empowerment scale

Empowerment was measured using a 28-item scale questionnaire (Rogers et al., 1997) containing a 4-point agreement scale ranging from 4=strongly disagree to 1=strongly agree. Sample questions from the tool include "I generally accomplish what I set out to do" and "I have a positive attitude about myself". Total scores range from 28 to 112. Higher total score indicates lower levels of empowerment. In this study the scale had a Cronbach's alpha of 0.88.

### Ethics considerations

The study was approved by the Research Ethics Committee of Mbarara University of Science and Technology (# 02/05–20). The RA sought consent from eligible participants after providing and clarifying information. Adolescents provided assent and/or consent before enrolment in the study. For adolescents below the age of consent (below 18 years) we obtained assent after their caregivers provided consent. Emancipated minors (adolescents below 18 years of age but living independently), and empowered adolescents (adolescents below 18 years who have been empowered to be responsible for their HIV care), (Uganda National Council for Science and Technology, 2007) provided written informed consent on their own.

## Data analysis

Descriptive statistics were used to analyze participants' characteristics and variables associated with internalized HIV stigma including resilience, health locus of control, coping self-efficacy and empowerment. Independent t-test was used to compare mean scores of the main predictor variables (resilience, health locus of control, coping self-efficacy, and empowerment), and internalized HIV stigma of adolescents attending boarding versus day schools. We also conducted multiple linear regression models specifying internalized HIV stigma as the outcome variable with empowerment, health locus of control, resilience and coping self-efficacy as the main predictor variables. Then we conducted a multivariable regression linear regression model including all factors that were significantly correlated with HIV stigma at bivariate analysis including sociodemographic characteristics (boarding school and level of education) and the intrapersonal factors (resilience, empowerment, internal locus of control, and coping self-efficacy) All analyses were conducted in Stata version 16 (StataCorp LP, College Station, Texas).

## Results

We recruited 173 participants with average age of 16 (IQR 3) years with a minimum and maximum of 13 and 18 years respectively. All participants were single, had formal education and majority had acquired secondary education (66.5%), Table 1.

### Intrapersonal factors

The internalized HIV stigma scores were significantly higher among adolescents attending boarding schools compared to their peers in day schools (p-value <0.001). There were also statistically significant differences in the mean scores of internalized HIV stigma and intrapersonal factors (resilience, health locus of control, self-efficacy and empowerment) between participants who were in boarding schools and those who were in day schools (Table 2).

### Intrapersonal factors associated with Internalized HIV stigma

At bivariate linear regression analysis being in a boarding school ( $\beta=0.73$ , 95% CI 0.31–1.16;  $p=0.001$ ), internal health locus of control ( $\beta=-0.095$ , 95% CI:  $-0.123$ -  $-0.068$ ;  $p<0.001$ ) empowerment ( $\beta=0.07$ , 95% CI: 0.04– 0.10;  $p<0.001$ ) were strongly positively correlated with internalized HIV stigma, while primary level of education was moderately correlated with internalized HIV stigma ( $\beta=1.06$ , 95% CI: 0.142–1.97,  $p=0.024$ ). On the other hand, resilience ( $\beta= -0.03$ , 95% CI:  $-0.040$ -  $-0.023$ ;  $p<0.001$ ) and coping self-efficacy ( $\beta=-0.02$ , 95% CI:  $-0.023$ - $0.015$ ;  $p<0.001$ ), were strongly negatively correlated with internalized HIV stigma (Table 3). After adjusting for covariates that were significant at bivariate linear regression analysis (sociodemographic characteristics school type and level of education) and the intrapersonal factors (resilience, empowerment, health locus of control, and coping self-efficacy), the linear regression model showed that internal health locus of control ( $\beta=-0.044$ , 95% CI:  $-0.080$ -  $-0.01$ ;  $p$ -value<0.001) and coping self-efficacy ( $b=-0.02$ , 95% CI: 0.021-  $-0.008$ ; <0.001) remained strongly negatively correlated with internalized HIV stigma (Table 4).

## Discussion

The study findings showed higher levels of internalized HIV stigma among ALHIV in boarding schools compared ALHIV in day schools. Additionally, ALHIV in boarding schools were less resilient and with lower scores on the coping self-efficacy scale. However, ALHIV in boarding schools scored higher on the empowerment scale. The study findings also showed that internal health locus of control, and coping self-efficacy had a strong negative correlation with internalized HIV stigma while empowerment had a strong positive correlation with internalized HIV stigma. However after mutually adjusting for all the covariates, internal locus of control and self-efficacy remained strongly negatively correlated with internalized HIV stigma.

These findings are consistent with those of a study conducted in southwestern Uganda, which found that ALHIV students attending boarding schools reported feeling stigmatized in addition to a higher risk of bullying following unintentional HIV status disclosure (Kihumuro et al., 2021). HIV stigma affects the adolescents' ability to adhere to their ART medication as they struggle to keep their HIV status a secret (Ashaba et al., 2018; Ashaba et al., 2019; Inzaule et al., 2016; Kihumuro et al., 2021; Mutwa et al., 2013; Zanoni et al., 2019). Unintended disclosure of the HIV status may aggravate HIV stigma and bullying, resulting in a lack of social support that negatively impacts ART adherence, while others drop out of school to remain in HIV care (Ashaba et al., 2019; Jacobi et al., 2020; Kihumuro et al., 2021; Kimera et al., 2020). The need to conceal their HIV status denies them the ability to build strong peer relationships which are valued at this stage of development towards maturity and independence (Folayan et al., 2014). Moreover, adolescents in boarding schools lack the support from parents while they are away at school which is vital for ART adherence (Mutwa et al., 2013) and the school environments do not offer the necessary privacy to enable the ALHIV take their HIV medicines (Abubakar et al., 2016; Wolf et al., 2014). Furthermore, school environments are unfavorable due to strict routines that require ALHIVs to ask for permission to honor their clinic appointments for medical refills and reviews while the time spent travelling from school to the clinic causes the majority of students to fall behind in their academics (MacCarthy et al., 2018; Zanoni et al., 2019).

The finding that internal health locus of control, resilience, and coping self-efficacy had a negative correlation with internalized HIV stigma is in line with previous studies among both adolescents and adults living with HIV (Andren et al., 2011; Andrinopoulos et al., 2010; Kurniawan & Fitrio, 2019). High internal locus of control is associated with positivity, and the feeling of being in charge of one's health hence less feelings of stigmatization and good health outcomes such as adherence to medications (Basinska & Andruszkiewicz, 2012; Nazareth, 2016). Overall empowered adolescents are less likely to feel stigmatized because they have a better understanding of their condition which enables them to make well-informed decisions while being aware of the positive consequences (Náfrádi et al., 2017). This emphasizes the significance of providing ALHIV with reliable information about their condition and the challenges that come with it so that they can make well-informed health-care decisions (Casale et al., 2019; Okonji et al., 2020). By empowering these adolescents will improve their coping self-efficacy and resilience and resulting in

better treatment outcomes (Earnshaw et al., 2015; Harrison et al., 2019). The findings of this study suggest that interventions promoting self-efficacy, internal health locus of control and resilience among ALHIV are needed to reduce internalized stigma in this population.

This study has several limitations. The study was conducted in a health facility where all participants were enrolled in HIV care hence may not be a true representation of ALHIV in the community. There is also need to assess the effect of these intrapersonal factors among adolescents with horizontally acquired HIV since this has significant psychosocial implications. Additionally, some of the tools used in this study have not been validated for use among ALHIV in Uganda and this could have affected the interpretation of the study findings. Furthermore, we did not assess for availability of social support systems including nurses and counselors in the schools, especially the board schools which more than half of our study participants attended and these could have affected our study findings. However, according to previous research the boarding school environment has been identified as a major structural barrier to ART adherence due to lack of privacy that comes with HIV stigma in addition to other factors within the school environment including lack of parental and family support that most ALHIV need for their lifelong treatment (Madiba & Josiah, 2019; Nyogea et al., 2015). Moreover the fear of unintended HIV status disclosure and HIV stigma is more pronounced in boarding schools due to discrimination and social isolation, such that even when these support systems are available in these schools ALHIV don't easily open up about their status (Madiba & Josiah, 2019).

Last but not least, we did not collection information on the duration of ART among our study participants and the regimens and these are likely major confounders that could have affected interpretation of our study findings. However, although longer duration on ART has been associated with increased access to social support and reduced stigma among adults with HIV (Mbonye et al., 2013; Pearson et al., 2009; Tsai et al., 2013a), extended duration on ART has been associated with persistent HIV stigma among ALHIV (Ashaba et al., 2018; Ashaba et al., 2019; Treves-Kagan et al., 2015). Hence, despite initiation on ART there is need for persistent psychosocial support for adolescents living with HIV to improve overall wellbeing and treatment outcomes (Ashaba et al., 2022a; Ashaba et al., 2022b; McHenry et al., 2017)

## Conclusion

The study findings show that ALHIV attending boarding schools have higher levels of internalized HIV stigma compared to their peers in day schools. The findings show a strong correlation between intrapersonal factors including internal locus of control, resilience, empowerment, and coping self-efficacy among adolescents living with HIV especially those attending boarding schools. Although correlation does not necessarily mean association, the findings suggest that interventions focusing on intrapersonal factors such as internal locus of control, empowerment, and resilience may contribute towards reduction of HIV stigma among adolescents in boarding schools.



## Acknowledgements

Special appreciation goes to participants who voluntarily gave useful information that has yielded this manuscript which will contribute to science as well as the people who collected this data.

## Funding

This study did not receive any funding. The financial support was provided by the authors and it had no role in study design, data collection, analysis, or interpretation of data as well as the submission for publication. Dr. Ashaba acknowledges salary support from grant number K43TW011929.

## Availability of data and materials

All data generated and analyzed during this study are included in this manuscript.

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**Table 1.**

Summary characteristics of the participants (n=173).

Variables	Total	School type		P-value
	Frequency, n (%) or Median (IQR)	Boarding, n (%) or median (IQR)	Day, n (%) or Median (IQR)	
Median age (in years)	16 (3)	14 (2)	16 (2)	<0.001
<i>Sex</i>				
Male	76 (43.9)	43 (47%)	33 (41%)	0.43
Female	97 (56.1)	49 (53%)	48 (59%)	
<i>Education level</i>				
Primary	47 (27.2)	43 (91.5%)	4 (8.5%)	<0.001
Secondary	115 (66.5)	44 (38%)	71 (62%)	
Tertiary level	11 (6.3)	5 (45%)	6 (55%)	
<i>School type</i>				
Boarding	92 (53.2)			
Day	81 (46.8)			
Residence at household level				
Rented	38 (22%)	23 (25%)	15 (18.5%)	0.30
Own	135 (78%)	69 (75%)	66 (81.5%)	
<i>Food security</i>				
Yes	139 (80.4)	72 (78.3%)	67 (82.7%)	0.46
No	34 (19.6)	20 (21.7%)	14 (17.3%)	
<i>Current caregiver</i>				
Both parents	54 (31.2)	32 (34.8%)	22 (27.2%)	
Mother alone	71 (41.0)	36 (39.1%)	35 (43.2%)	0.82
Father alone	7 (4.1)	4 (4.4%)	3 (3.7%)	
Grandparents	23 (13.3)	12 (13.0%)	11 (13.6%)	
Other relatives	18 (10%)	8 (8.7%)	10 (12.4%)	
HIV stigma score	3 (2)	3 (2)	2 (1)	0.02
<i>Health locus of control score:</i>				
Internal	30 (11)	29 (11.5)	31 (7)	0.46
Chance	23 (7)	23 (8)	23 (7)	0.38
Powerful others	31 (5)	33 (3)	30 (6)	0.001
Resilience	131 (35)	124 (36)	137 (28)	0.23
Coping self-efficacy	162 (71)	146 (60)	171 (66)	0.35
Empowerment	63 (7)	63 (7.5)	62 (8)	0.66

\* Other relatives; siblings =9), aunt=5, guardian =1, uncle=1, stepmother=1 alone = 1

IQR = Interquartile range.

**Table 2.**

Comparing mean scores of Intrapersonal factors of the participants stratified by type of school

	School Type				
	Boarding		Day		P-value
Variable	Mean (SD)	95%CI	Mean (SD)	95%CI	
Internalized AIDS-related stigma	3 (1.5)	3.01–3.61	2.6 (1.4)	<b>2.27–2.88</b>	<b>&lt;0.001</b>
Health locus of control score					
Internal	27.3 (7.4)	25.74–28.80	30.4 (6.2)	29.02–31.76	<b>0.003</b>
Chance	22.8 (5.2)	21.77–23.92	22.2 (5.8)	20.96–23.52	0.47
Powerful others	31.4 (3.6)	30.69–32.17	29.3 (4.1)	28.43–30.23	<b>&lt;0.001</b>
Resilience score	123.2 (22.9)	118.4–127.9	135.0 (20.2)	130.5–139.4	<b>&lt;0.001</b>
Coping self-efficacy score	152.0 (49.9)	143.3–160.7	178.4 (40.1.3)	169.5–187.3	<b>&lt;0.001</b>
Mean empowerment score	63.4 (6.4)	62.12–64.76	61.7 (6.2)	60.34–63.08	<b>0.036</b>

**Table 3.**

Bivariate linear regression model of the factors with internalized HIV stigma among the study participants (n=173)

Variable	Beta	95% CI	P-value
Age	0.001	-0.001-0.002	0.52
<i>Sex</i>			
Male	Ref	ref	ref
Female	0.089	-0.35-0.53	0.69
<i>Education level</i>			
Tertiary level	ref	ref	ref
Primary	1.06	0.142-1.97	0.024
Secondary	-0.066	-0.93-0.79	0.88
<i>School type</i>			
Day	Ref		
Boarding	0.73	0.31-1.16	0.001
<i>Residence at household level</i>			
Rented house	ref	ref	ref
Owned by the family	-0.171	-0.71-0.36	0.52
<i>Food security</i>			
Yes	Ref		
No	0.44	-0.113-0.99	0.12
<i>Current caregiver</i>			
Father alone	ref	ref	ref
Both parents	0.12	-1.05-1.30	0.83
Mother alone	0.06	-1.10-1.22	0.92
Grandparents	0.32	- 95-1.56	0.62
Other relatives	0.087	-1.22-1.39	0.83
<i>Health locus of control score</i>			
Internal	-0.095	-0.123- -0.068	<0.001
Chance	0.02	-0.02-0.06	0.34
Powerful others	0.05	-0.002-0.12	0.058
Resilience	-0.03	-0.040- -0.023	<0.001
Coping self-efficacy	-0.02	-0.023-0.015	<0.001
Empowerment	0.07	0.04- 0.10	<0.001



**Table 4:**

Multivariable linear regression analysis of the factors associated with internalized HIV stigma among the study participants (n=173)

Variable	$\beta$	95% CI	P-value
Education level	-0.122	-0.44-0.20	0.45
School type	-0.124	-0.53-0.28	0.54
Food security	0.180	-0.30-0.65	0.46
Health locus of control score			
Internal	-0.044	-0.080- -0.01	0.016
Chance	0.030	-0.007-0.080	0.12
Powerful others	0.013	-0.036-0.062	0.59
Resilience	0.004	-0.011-0.020	0.58
Coping self-efficacy	-0.015	0.021- -0.008	<0.001
Empowerment	0.022	-0.010-0.055	0.17