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Can Social Support Mediate Stigma and Perceived Stress in People Live with Human Immunodeficiency Virus?

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Abstract

Stigma has heavily impacted People Living with HIV (PLWH). Limited studies report on how social support affects HIV-related stigma and perceived stress, especially in Myanmar. During first seven months of 2020, a random sample of 248 eligible PLWH were contacted from a private, closed Facebook group with more than 18,000 Myanmar people, where 90% of the members were PLWH. Variables collected included demographics data, perceived stress, social support, and HIV stigma. After controlling for the effects of demographic variables, the path from HIV stigma to perceived stress (direct effect β=0.40) and though the mediation of social support was significant (indirect effect β=0.014). However, the mediating effect of social support was non-significant between HIV stigma and perceived stress. This exploratory study shows that social support did not have the expected effect of decreasing perceived stress in PLWH in Myanmar. Interventions to reduce HIV stigma to decrease perceived stress should consider other strategies, e.g., spirituality-based practice, to reduce perceived stress in Myanmar PLWH.

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Fei-Fei Huang contributed equally as the first authors.

Authors' contributions

All authors on this paper meet the four criteria for authorship as identified by the International Committee of Medical Journal Editors (ICMJE); all authors have contributed to the conception and design of the study, drafted or have been involved in revising this manuscript, reviewed the final version of this manuscript before submission, and agree to be accountable for all aspects of the work.

Conflict of Interest Statement

We indicate that all of us had knowledge of and adherence with the Journal's Conflict of Interest policy, and we do not have any conflict of interest in this study.

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Keywords

HIV; perceived stress; stigma; social support; Myanmar

Introduction

Stigma is a major risk factor for the well-being and survival of people living with HIV (PLWH). HIV, since its discovery in 1980s, has been a highly stigmatized disease, especially in resource-limited countries like Myanmar. After three decades of research, it is widely agreed that HIV stigma, both external and internal, can negatively impact well-being and survival of PLWH across the globe through multiple pathways (Ho & Holloway, 2016; Mahajan et al., 2008; Monjok et al., 2009; Paudel et al., 2015; Turan et al., 2017). More specifically, HIV stigma is found to be a major barrier for accessing social support and health services (Chambers et al., 2015; Gesesew et al., 2017; Rueda et al., 2016; Stockton et al., 2018; Turan & Nyblade, 2013). It can also impact PLWHA's mental health (Hatzenbuehler et al., 2011; Lowther et al., 2014) and health behaviors required for optimal self-management, such as adherence to medications (Katz et al., 2013; Sweeney & Vanable, 2016). Among PLWH in Asia, it is also found that HIV stigma has negative impacts on mental health and HIV self-managing behaviors of PLWH (Churcher, 2013), leading to deteriorated subjective well-being (Liu Y et al., 2014; Yi et al., 2015), physical health (Rangarajan et al., 2016; Zhang et al., 2015; Zhang et al., 2016), and survival (Go et al., 2017).

Specificially in Myanmar, due to this highly stigmatized disease, 60% of PLWH felt ashamed due to their sero-status, and many of them failed to seek health services due to the anticiptated stigma (Than et al., 2021). Researchers have been working continuously to discern how to decrease HIV-related stigma and how to enhance mental health in those living with HIV.

Social support refers to the assistance and protection given by others, such as families, friends and the society (Skakoon-Sparling et al., 2022). The stress-buffering model proposes that social support provides PLWH with physical and/or psychological resources to appraise stressful situations in less negative ways and thereby helps PLWH manage stressful situations, such as HIV stigma, in a more positive way (Cohen & Wills, 1985). However, evidence of the stress-buffering effects of social support is mixed - some studies report social support can moderate effects of HIV-related stressors (Garfin et al., 2019; Hou et al., 2014; Srisorrachatr et al., 2013), while others fail to show effects on HIV-related stigma (Earnshaw et al., 2015).

Background

HIV is a highly stressful condition for PLWH (Kamitani et al., 2018). Studies show negative emotional effects on PLWH, such as stress, fear, worry, anxiety and depression, as well as social impacts including stigma, discrimination and isolation (Fauk et al., 2022). Perceived stress and stigma are shown to be positively associated with depressive symptoms (Yeh et al., 2012). In addition, stigma and perceived stress are risk factors for depressive

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symptomology (Li et al., 2016). However, few studies have explored the effect of social support between HIV stigma and perceived stress among PLWH in Myanmar, though one study has shown that when PLWH face challenges in life, they usually seek out social supports (de la Perriere, 2017). By examining the interacting relationships among HIV stigma, social support, and perceived stress, this study aimed to demonstrate the role of social support in reducing HIV stigma and perceived stress. Based on empirical evidence, we propose two hypotheses (see Figure 1): (1) HIV stigma is positively associated with perceived stress and negatively associated with social support; and (2) social support mediates the relationship between HIV stigma and perceived stress.

Methods

Participants

During January 2020 to July 2020, a sample of 248 eligible PLWH were contacted from a closed Facebook group that included more than 18,000 people in Myanmar, 90% of whom were PLWH. Others group members were healthcare providers, public health officers and NGO organizers. We used a random sampling method to recruit potential study participants, selecting every fifth individual on the Facebook roster to contact. Participants completed a screening questionnaire to ensure they met study eligibility criteria of: at least 18 years of age, diagnosed with HIV, able to provide informed consent, and lived within Myanmar. One hundred and ninety-four (194) participants completed the study.

Procedures

This cross-sectional, descriptive study was approved by the relevant institutional review boards (UCLA #18-001767 & UPH-IRB [2019/Research/40]), and adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement. If participants agreed to participate, passed the screening questions, and were able to provide informed consent, a link to the study survey was sent directly to the participant. All information was collected online through the Research Electronic Data Capture (REDCap) system, a web-based survey tool that is supported through the involved institutions. Out of 248 PLWH who passed the screening questions, 194 PLWH participants (78%) completed the REDCap survey. After completing the survey, participants received a small sum of money for their participation.

Measures

Social support—Social support was measured by the 19-item MOS-SSS-M, which was translated and adapted from the English version of MOS-SSSS (Sherbourne & Stewart, 1991). The 19-item MOS-SSS-M includes four factors: (emotional/informational support, tangible support, affectionate support, and positive social interaction). All of the instrument's items were rated using a 5-point Likert scale (1 = "*none of the time*" to 5 = "*all of the time*"). A higher score indicated a higher level of social support. The overall Cronbach's alpha reliability estimate for this sample was 0.97.

HIV stigma—HIV stigma was measured by the Myanmar version of the HIV stigma scale, which was adapted from Berger's HIV stigma scale (Berger et al., 2001) (e.g., "*I*

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worry people who know I have HIV will tell others") and the Indian HIV stigma scale (Steward et al., 2008) (e.g., *"I feel that I am paying for karma or sins because I have HIV." and "I've been refused medical care or denied hospital services because I have HIV."*). The 35-item Myanmar version of the HIV stigma scale included six factors (personalized stigma, disclosure concerns, negative self-image, concern with public attitudes about HIV, healthcare provider's stigma, and religious concerns). All of the items were rated using a four-point Likert scale (1 = "*strongly agree*" to 4 = "*strongly disagree*"). A higher score indicated a higher level of HIV stigma. The overall Cronbach's alpha reliability estimate for this sample was 0.95.

Perceived Stress—The severity of stress experienced during the prior month by PLWH was measured by the PSSHIV-M, which was adapted from the English version of PSSHIV (Su et al., 2008) The 31-item PSSHIV-M included five factors (function problems and medical care, work-related issues, sexual relationships, psychological problems, and social/family issues). All of the items are rated using a 5-point Likert scale (1 = *absolutely not stressful* to 5 = *extremely stressful*). The overall Cronbach's alpha reliability estimate for this sample was 0.95.

Demographic characteristic—Demographic variables that were collected included participants' age, gender, marital status, ethnicity, education level, and employment status. Years of living with HIV, type of antiretroviral therapy, and recent CD4 and viral load were also collected.

Data analysis

We conducted data analyses using SPSS 24.0 and AMOS 23.0 (IBM, Chicago, IL). In this study, the data met the assumptions of normality (a one-sample Kolmogorov-Smirnov test did not show statistical significance). The continuous variables were expressed as means and standard deviations (SD). Categorical variables were expressed as proportions or percentages. First, we conducted Pearson's correlation analyses to examine the relationships among stigma, social support and perceived stress. Second, we used the bias-corrected percentile bootstrap method (repeated 5,000 times) to test multiple mediation analyses to explore the mechanism through which perceived stress can be influenced by HIV stigma when considering social support as mediator. The following fit indices of the model were used (Hu & Bentler, 2009) normed chi-square ($\chi 2$/df, 1.0±3.0, p >0.05), root mean square error of approximation (RMSEA <0.08), comparative fit index (CFI >0.9), and Tucker-Lewis Index (TLI, >0.9). We replaced missing data using the full information maximum likelihood strategy and p <0.05 was considered significant.

Results

Sample characteristics

The mean age of participants was 28.23 years (*SD*=17.16) and the average years of living with HIV was 6.90 years (*SD*=6.61). The average recent CD4 count was 667.38 (*SD*=455.84) and the average viral load was 615.00 (*SD*=1,058.55). The details of the socio-demographic characteristics of the participants are presented in Table 1.

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Bivariate correlations

As shown in Table 2, HIV stigma was significantly positively correlated with perceived stress, while social support was significantly negatively correlated with HIV stigma and perceived stress, respectively.

The mediating effects analyses

We controlled for the effects of all the demographic variables which included participant age, gender, marital status, ethnicity, education level, employment status, as well as years of living with HIV, type of antiretroviral therapy, and recent CD4 count and viral load in the model. The results of the mediating effect of social support are shown in Table 3 and Figure 2. The path from HIV stigma to perceived stress (direct effect β=0.40) and though the mediation of social support was significant (indirect effect β=0.014), and the path from social support to perceived stress was non-significant (p> 0.05). The pathway fit well to the data ($\chi 2(27) = 2.224$, $p = 0.01$, RMSEA = 0.04, CFI = 0.95 & TLI = 0.90).

Discussion

In this study, we hypothesized that social support can mediate the relationship between perceived stress and HIV stigma in PLWH residing in Myanmar. Given high levels of HIV-related perceived stress, increasing attention is being given to investigate how HIV stigma may affect potential psychological factors such as perceived stress (Garcia Saiz et al., 2021; Zhu et al. 2020). Ours is one of the first studies to consider the mediating effects of social support in relation to HIV stigma and perceived stress. Our results reveal a positive association between HIV stigma and perceived stress, indicating that higher levels of HIV stigma are related to increased levels of perceived stress. In addition, PLWH with higher levels of HIV stigma presented with lower levels of social support. However, there was no significant mediation between HIV stigma and perceived stress among our sample of PLWH from Myanmar.

This analysis presented several significant mechanistic pathways. The first is that HIV stigma has a significantly positive effect on perceived stress, which is echoed in several other studies (Li et al., 2022; Tong et al., 2022). In Myanmar, PLWH are challenged by a multitude of HIV-related stressors, including socioeconomic disadvantages (Veronese et al., 2020), HIV-related stigma from healthcare providers (HCP) or peers (Tun et al., 2019), and lack of family and social support (Aung et al., 2021; Veronese et al., 2021). Major barriers for PLWH due to lack of the in-country infrastructure result in other factors that may negatively affect health status including low ART uptake (Lum et al., 2020), lack of viral load testing (Thinn et al., 2019), and an underfunded and under-resourced healthcare system for HIV care (Casale et al., 2019; Thein et al., 2021). All of these factors can contribute to worsened perceived stress for PLWH (Tun et al., 2019).

The second pathway hypothesized HIV stigma influences perceived stress through social support as seen in Figure 1. However, our results indicate the effect of HIV stigma through social support alone did not produce a significant influence on perceived stress, in other words, social support alone cannot decrease perceived stress in Myanmar PLWH. Similar

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to other studies (Casale et al., 2019; Garfin et al., 2019), social support did not mediate the relationship between perceived stress and HIV stigma. This might be due to the high perceived stigma in the country with limited or no official social support system which can reinforce stigma and discriminatory practices (Huang et al., 2021). In addition, social support or external attention can be potentially interpreted as enacted stigma for Myanmar PLWH. As a downstream effect, our study yielded a smiliar result with higher HIV stigma tied to less social support, representing a significant pathway to perceived stress (see Figure 2).

However, other studies have shown physical support can decrease perceived stress in everyday life, especially in men living with HIV (Than et al., 2021). In these Myanmar men with HIV, psychological support delivers protective messages to enhance the sense of meaning and purpose in lives (Than et al., 2021). PLWH can use such interventions to problem-solve, implement healthier lifestyles, acquire self-compassion, use mindfulness-based stress reduction methods, and provide avoidance or an escape from reality (Tong et al., 2022). These protective factors buffer against the negative effects of HIV-related stigma and thereby lower levels of perceived stress (Casale et al., 2019).

Future interventions should consider removal of stigma to reduce perceived stress as a potential strategy, as well as incorporate culturally-sensitive aspects into interventions, e.g., spirituality, as such factors are significantly associated with perceived stress and stigma among PLWH in Myanmar (Huang et al., 2021; Huang et al., 2021). Reducing stigma and perceived stress can enhance mental health in PLWH (Yeh et al., 2012). Multilevel interventions to reduce stigma and perceived stress combined with building up infrastructures to enhance social support systems may enhance mental health in Myanmar (Zhu et al., 2020).

Limitations

There are several limitations of this study. First, the results were based on self-reports, and the sample was recruited from Facebook, potentially limiting the interpretation of causality among variables and the generalizability of findings. However, this project is one of the first few projects conducted in Myanmar before the military coup, since then, it has been exceedingly difficult to carry out research there. Second, cross-sectional survey results should not be interpreted as having causal inference. Third, with limited in-country internet connectivity in Myanmar, recruitment relying on online surveys may be more difficult in future projects. Fourth, we suspect that within the social support scale, the subscale may be broken down into types of social support that include emotional/informational support, tangible support, affectionate support, and positive social interaction. In addition, limited research conducted in Myanmar shows gender plays an important part in social support analyses. Therefore, in future studies that have a larger sample size, analysis should be divided by gender and by the subscales of social support to clarify whether specific types of support mediate perceived stress. Fifth, PLWH in Myanmar heavily rely on Facebook and use popular social media to exchange information and seek health resources, yet rural places in Myanmar may lack internet infrastructure. After the Febuary 2021 military coup, the situation for residents of Myanmar got worse after the country’s limited infrastructure

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was largely destroyed during the unrest. Therefore, even with random sampling methods, potential study participants who do not have stable internet access will not be able to share their experiences with researchers resulting in sampling bias. Last, factors such as the time since HIV diagnosis, viral load and individuals' HIV management strategies may also serve as important factors that influence stigma, social support and perceived stress. Including these variables in future studies could offer a more comprehensive understanding of the experiences of PLWH in Myanmar.

Conclusion

This study provides insights into the relationships among HIV stigma, social support, and perceived stress. Specially, we found that HIV stigma positively influences perceived stress but not social support. This exploratory study offers that HIV stigma affects perceived stress among Myanmar PLWH but does not establish a mediating role for social support. Future interventions to reduce HIV stigma and perceived stress in PLWH in Myanmar should consider adding other culturally-based strategies, e.g., spiritual practices, to influence change.

Relevance to clinical practice

These study findings offer preliminary evidence that social support might not serve as a potential factor to mediate decreases in HIV-related stigma and perceived stress in Myanmar PLWH. This finding sheds light on resource-limited countries, e.g., Myanmar, in which social support policies are lacking and PLWH experience worse HIV stigma when compared to countries with well-trained staff to assist those coping with HIV, and thus decrease their perceived stress. This paper provides valuable guidance for healthcare providers in designing culturally-sensitive interventions to reduce HIV stigma, and thereby decrease perceived stress in PLWH where social support might not be as effective as expected. Using culturally-sensitive strategies such as spirituality practices, to reduce stigma and perceived stress, creates a culturally-tailored intervention to affect change. This project explores the potential effect of social support between HIV stigma and perceived stress among PLWH in Myanmar.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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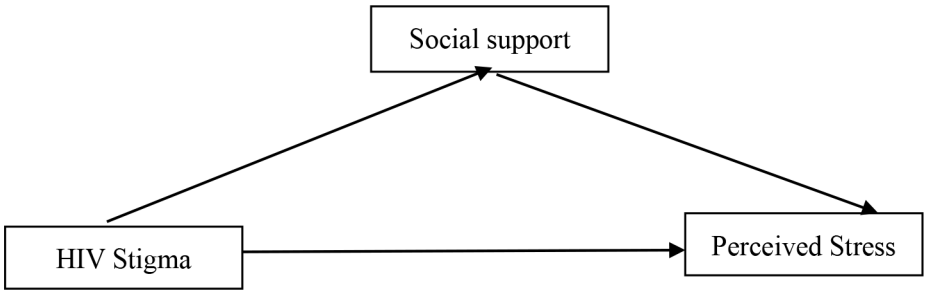

Figure 1. Hypothesized relationships among HIV stigma, social support and perceived stress.
All demographic variables will be controlled in this hypothesized model which includes participant age, gender, marital status, ethnicity, education level, employment status, and years of living with HIV, type of antiretroviral therapy, and recent CD4 count and viral load in the model.

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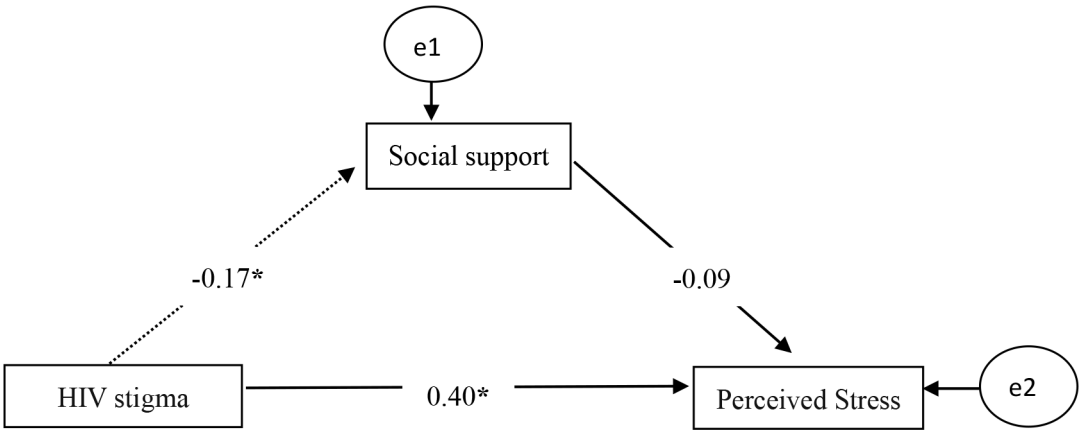

Figure 2. The final pathway.

* $p \leq 0.05$

All demographic variables were controlled in this final pathway which includes participant age, gender, marital status, ethnicity, education level, employment status, and years of living with HIV, type of antiretroviral therapy, and recent CD4 count and viral load in the model.

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Table 1.

Sociodemographic characteristics of the participants (*N*=194).

Variable	*N* (%)
Gender	
Male	124 (64)
Transgender	2 (1)
Ethnicity	
Bamar†	152 (79)
Marital status	
Married or steady partner	82 (42)
Single, never married	70 (36)
Widowed	20 (10)
Divorced	13 (7)
Separated	9 (5)
Educational level	
High school graduation	79 (41)
College graduation	54 (28)
Middle school graduation	26 (14)
Some college but no degree	27 (14)
Post-college graduate	5 (3)
Professional (vocational) training school graduation	2 (1)
Employment status	
Full time	113 (58)
Part time	42 (24)
Unemployed	39 (20)
Health insurance	
Not enough	161 (83)
Just enough	33 (17)
CD4 cell count	
≥500 cells/mm^3	97 (50)
200~499 cells/mm^3	39 (20)
<200 cells/mm^3	58 (30)
HIV viral load	
Undetectable	142 (73)
Detectable	10 (5)
Unknown	42 (22)

†Rest ethnicities includes Mon, Kayin, Shan, Kachin, Chin, Kayah, Rakhine, Palaung, Islam, Tamil

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Table 2.

Descriptive statistics and bivariate correlations.

	Mean (SD)	1. (PS)	2 (HS)	3. (SS)
1. Perceived stress (PS)	88.15 (59.31)	-		
2. HIV stigma (HS)	112.21 (33.24)	0.30**	-	
3. Social support (SS)	71.64 (13.71)	−0.19**	−0.26†	-

Notes. SD= standard deviation;

* $p<0.05$;

** $p<0.01$

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Table 3.

Coefficients effects on the mediation model.

Endogenous variable	Predicting variable	Standardized direct effect β	Standardized indirect effect β	Standardized total effect β
HIV stigma	Perceived stress	0.382 *	0.014 *	0.396 *
	Social support	−0.169 *	/	−0.169 *
Social support	Perceived stress	−0.085	/	−0.085

* $p<0.01$