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RESEARCH METHODOLOGY PAPER

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Development of an 18-item abbreviated Chinese version of Berger's HIV Stigma Scale

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Abstract

Aim: Human immunodeficiency virus (HIV) stigma in people living with HIV is associated with depression and poor treatment adherence. The current literature lacks a Chinese instrument to measure HIV stigma in Taiwan. Thus, the purpose of this study was to develop an abbreviated Chinese translation version of Berger's HIV Stigma Scale.

Methods: The instrument development process was guided by Brislin's Translation Model of establishment of construct validity and convergent validity and verification of reliability.

Results: This study recruited 540 HIV-infected adults (January-November 2015). Data analysis using confirmatory factor analysis resulted in an 18-item abbreviated Chinese version of Berger's HIV Stigma Scale, consisting with four factors: personalized stigma (seven items), disclosure concerns (three items), negative self-image (four items), and concerns with public attitudes toward people with HIV (four items). The final model demonstrated a good fit. A positive correlation between HIV stigma and depression was found. The Cronbach α for internal consistency was 0.92.

Conclusion: The 18-item abbreviated Chinese version of Berger's HIV Stigma Scale demonstrated adequate reliability and validity to assess HIV stigma among Chinese people living with HIV. It is a feasible tool that allows for rapid assessment of HIV-related stigma.

KEYWORDS

18-item abbreviated Chinese version of the Berger's HIV Stigma Scale, confirmatory factor analysis, HIV stigma, instrument development, Taiwan

SUMMARY STATEMENT

What is already known about the topic?

- People living with HIV experience challenges including unemployment, unavailability of rental housing, isolation, and alienation by friends and families. Prolonged experience of stigma may result in poor adherence to antiretroviral therapy.
- Berger's HIV Stigma Scale is a commonly used, valid instrument to measure HIV-related stigma in people living with HIV.

What this paper adds?

- In Taiwan, there is a lack of self-report instrument to assess HIV-related stigma in people living with HIV. Therefore, the authors developed an abbreviated Chinese version of Berger's HIV Stigma Scale for Chinese people living with HIV and established the psychometric properties.
- This study used confirmatory factor analysis (CFA) to verify effectiveness and test construct validity of the 18-item abbreviated Chinese version of Berger's HIV Stigma Scale.

- This study revised Berger's 40-item HIV Stigma Scale to an abbreviated 18-item abbreviated Chinese version of Berger's HIV Stigma Scale to increase validity and to allow for rapid and effective assessment of HIV-related stigma in people living with HIV.

The implications of this paper:

- The 18-item abbreviated Chinese version of Berger's HIV Stigma Scale has adequate reliability and validity to be used for Chinese people living with HIV.
- The 18-item abbreviated Chinese version of Berger's HIV Stigma Scale is a feasible tool that allows for rapid assessment of HIV-related stigma in Chinese people living with HIV.
- The 18-item abbreviated Chinese version of Berger's HIV Stigma Scale assists clinicians to explore HIV-related stigma in Chinese people living with HIV and to evaluate effectiveness of interventions in reducing the stigma.

1 | INTRODUCTION

Approximately 36.9 million individuals were infected by the human immunodeficiency virus (HIV) in 2017 globally (World Health Organization, 2018). In Taiwan, the reported cases of HIV infection have increased from 9 in 1984 to 2515 in 2017 (growth rate = 270 times; Taiwan Center for Disease Control, 2018). HIV/AIDS is a notifiable noncurable chronic disease that is treated with combination antiretroviral therapy (cART) and involves a high cost of treatment (USD $470/month; Taiwan Center for Disease Control, 2017). People living with HIV often face physical, mental, spiritual, and social challenges; experience social stigma and discrimination; and bear shame and guilt as their family and friends become aware of the diagnosis (Lin, 2011).

Goffman (1963) defined stigma as "an attribute that is deeply discrediting," which reduces the bearers "in our minds from a whole and usual person to a tainted, discounted one" (p. 3). Link, Yang, Phelan, and Collins (2004) argued that the stigma process involves labelling, stereotyping, cognitive separating, emotion reaction, status loss and discrimination, and exercise of power. Herek (2009) indicated that stigma is manifested in prejudice, discounting, discrediting, and discrimination. Yang et al (2007) contended that the Chinese concept of "face" is being respected and associated with personal knowledge and morality. From an analysis of the embodiment of "face" in China, Yang and Kleinman (2008) proposed a three-layered stigma model describing stigma as a fundamental moral issue that threatens attainment of one's essential social status. People living with HIV are perceived as living against the moral and social norms and causing the family to be ashamed and losing face, which results in moral condemnation toward the HIV-infected individuals.

Health-related stigma are associated with various conditions, such as mental illnesses (Chang, Wu, Chen, & Lin, 2016; Chang, Yen, Jang, Su, & Lin, 2017; Corrigan, 2000), infectious diseases (Mak et al, 2006; Zhang, Liu, Bromley, & Tang, 2007), sexual orientations (Herek, 2007), race, and obesity (Dean, Roth, & Bobko, 2008; Lin & Lee, 2017; Roehling, Roehling, & Pichler, 2007). Manifestations of stigma vary in the context of diverse health conditions and cultures (Parker & Aggleton, 2003). HIV-related stigma manifests in prejudice, discounting, discrediting, and discrimination directed at people perceived to have AIDS/HIV and at the individuals, groups, and communities with which they are associated (Herek, 2002). Holzemer, Uys, Makoae, et al. (2007) described HIV-related stigma as resulting from impacts of environment (culture, economics, politics, law, and policies), health-care system, and agents (person, family, workplace, and community). HIV stigma mechanism measures have been described as including enacted stigma, anticipated stigma, and internalized stigma (Earnshaw & Chaudoir, 2009; Steward et al, 2008).

Challenges resulting from HIV-related stigma have been reported in the literature. Lowther, Selman, Harding, and Higginson' (2014) systematic review found over half of the people living with HIV experienced HIV/AIDS-related stigma, and prolonged experience of stigma led to unnecessary sufferings and poor adherence to antiretroviral therapy. Steward et al (2008) indicated that the more severe the HIV-related stigma, the higher the psychological stress. In Taiwan, people living with HIV are viewed with bias and discrimination as living a sexually promiscuous style, abusing drugs, practicing homosexuality, and deserving immediate consequences for immorality (Chuang & Liu, 1997). Such negative perceptions contribute to delay in seeking timely treatment, increase spreading of the virus and negatively impact the prognosis (Chuang & Liu, 1997). Yang et al (2007) used "moral perception" to explain the relationship between HIV-related stigma and the Chinese concept of "losing face." The concern of face has a deep root in the Chinese culture and profoundly impacts individuals' perceptions of outcomes of life events. Face is a public-self that represents "a social esteem accorded by others" (Yang, 1945, p.167) and a desire to "claim, maintain or enhance a positive social impression or image in the presence of others" (Lin & Yamaguchi, 2011, p.120). In the context of the Chinese cultural emphases of collective identity and filial piety, losing face implies shame and embarrassment that extends beyond the individual and affects his or her immediate and extended families (Braje & Hall, 2016). In people living with HIV, losing face may result in moral condemnation toward the infected individuals and the family (Yang et al, 2007).

A review of literature found seven instruments that directly measure stigma toward people living with HIV: the Stigma and Social Impact Scale (Fife & Wright, 2000), the HIV Stigma Scale (Berger, Ferrans, & Lashley, 2001), the HIV Stigma Scale (Emlet, 2005), the HIV/AIDS Stigma Instrument (Holzemer, Uys, Chirwa, et al., 2007), the Internalized HIV Stigma Scale (Sayles et al, 2008), the TB and HIV/AIDS Stigma Scale (Van Rie et al, 2008), and the Internalized AIDS-related Stigma Scale (Kalichman et al, 2009). However, there is no HIV-related stigma assessment instrument available in the Chinese language. The experience of HIV-related stigma among HIV in Taiwan is unknown.

Berger et al's (2001) HIV Stigma Scale (Berger's HSS) assesses perceived stigma, which encompasses four domains: personalized stigma, disclosure concern, negative self-image, and concerns with public attitudes. Berger's HSS is commonly used to measure HIV-related stigma with its contents covering all stigma mechanisms affecting people living with HIV (Earnshaw & Chaudoir, 2009). Thus, the authors translated Berger's HSS into Chinese and established its validity and reliability. Berger's HSS has been abridged (Bunn, Solomon, Miller, & Forehand, 2007; Kipp et al, 2015; Reinius et al, 2017;

Wright, Sylvie, Lam, Templin, & Frey, 2007) and translated into three languages: Spanish (Franke et al, 2010), Tamil (Jeyaseelan et al, 2013), and Swedish (Lindberg, Wettergren, Wiklander, Svedhem-Johansson, & Eriksson, 2014; Reinius et al, 2018; Wiklander et al, 2013). The above studies showed that abridgement of Berger's HSS reduced the scale to 3 to 4 domains and 8 to 40 items with good internal consistency (α = 0.81-0.96).

Berger et al's (2001) description of HIV-related stigma coincides with the Confucian philosophy and the Taiwanese cultural connotation of HIV infection. Confucianism is the central philosophic underpinning for much of the East Asian culture that emphasizes social harmony, obligations, interdependence, and fulfilment of social roles (Lin & Tsai, 2016; Tsai, Strong, & Lin, 2015). As people living with HIV become aware of the public prejudice and discrimination, their social identity may change negatively and result in altered self-concept and social withdrawal behaviours. Berger's description of HIV-related stigma also echoes the Taiwanese connotation of HIV infection that views the condition as "an illness," "a sin," "family shame," and "family shame not to be made public" (Chuang & Liu, 1997). Thus, the authors decided to translate Berger's HSS into Chinese and develop an abbreviated Chinese version.

2 | METHODS

2.1 | Aim

The aim was to develop an abbreviated Chinese translation version of Berger's HSS.

2.2 | Translation

Berger's HSS was translated from English to Chinese based on Brislin's model for translation and validation of instruments for cross-cultural research (Jones, 2001): (1) forward translation, (2) back translation, (3) group discussion, (4) semantic consistency, and (5) pilot test to ensure functional and conceptual appropriateness in cultural adaptation. Before the translation began, the authors obtained permission from Berger for language translation.

Forward translation was conducted by a US educated doctorally prepared nursing professor, proficient in English and Chinese, and experienced in translating nursing professional scholarly writings. Upon completion of the translation, the authors collaboratively made revisions on the translated Chinese version.

Then, a doctorally prepared American nursing professor and a master-prepared American registered nurse conducted the back translation from Chinese to English independently. These two translators are proficient in Chinese and English and have been employed in the United States for some time. Then, another US educated doctorally prepared nurse reviewed the accuracy and clarity of the Chinese 40-item HSS.

During the group discussion phase, items of the Chinese 40-item HSS were revised based on discussions of an expert panel, which comprised experienced clinicians with expertise in HIV care and the individuals conducting forward translation.

For semantic consistency, three people living with HIV and a 9-year-old child (for readability checking) reviewed the scale and concluded that the scale was easy to understand and could be completed within 20 minutes.

For clarity and comprehensibility, 30 people living with HIV pilot tested the scale, which resulted in a coefficient of.92 for internal consistency. However, the participants reported that the scale was tedious, lengthy, and had some redundancies, which indicated the necessity of deleting some items.

2.2.1 | Content validity

For content validity, two rounds of a Delphi study with a panel of five experts were conducted. The panel consisted of one individual with a PhD with expertise in linguistics, a physician specializing in infection control, and three doctorally prepared nurses. Three of the five panel experts held academic rankings of assistant professor or above. All panel experts were proficient in Chinese and English. The expert panel used a 5-point Likert scale rubric to rate the Chinese 40-item HSS on three criteria: cultural equivalence, relevance, and clarity of wording. Item scores of less than three indicated a need for major revision. Lynn (1986) recommended that content validity should be established through item-level CVI (I-CVI) and scale-level CVI (S-CVI): 3 to 5 experts with an I-CVI $\geqq$ 1, 6 to 10 experts with an I-CVI $\geqq$ 0.78, and the S-CVI universal agreement (S-CVI/UA) $\geqq$ 0.9. With five panel experts in this study, the I-CVI needed to be at least 1 and the S-CVI $\geqq$ .9. No items were deleted or added to the second version of the Chinese 40-item HSS. The first I-CVI was 0.92. The S-CVI/UA was 0.62. The authors revised the redundant wording and adjectives based on the panel's recommendations. Upon completion of the revisions, the second expert validity resulted in an I-CVI of 1.0 and an S-CVI/UA of 1.0. Therefore, all items were kept for further evaluation. The back translation version was similar to the original scale.

2.3 | Testing psychometric properties

2.4 | Setting and participants

Purposive sampling was used to recruit from an outpatient infection clinic in Taiwan. Patients aged 20 or older with a diagnosis of HIV who had follow-up visits between January and November 2015 were invited to participate. Patients with illnesses such as tuberculosis, cancer, and psychiatric disorders were excluded. Participation was voluntary and anonymous. After informed consents were obtained, participants completed a background information form, the Chinese 40-item HSS, and the Center for Epidemiological Study-Depression Scale (CES-D). Each survey took 15 to 20 minutes to complete.

With a sample-to-item ratio of 10:1 (DeVellis, 2012; Streiner, Norman, & Cairney, 2015) and a drop-out rate of 30%, a minimum sample size of 520 was needed for the Chinese 40-item HSS. There were 568 participants in this study. Responses from 28 individuals were incomplete and were deleted, which yielded a valid response rate of 95.1% (n = 540; attrition rate = 4.9%). There were 540 people living with HIV who provided valid responses, which was above the

minimal sample size of 520. According to the Taiwan Center for Disease Control (2015), the prevalence of HIV infection was 32,045 in 2015. This study recruited 540 participants, which was 1.74% of the HIV-infected population in Taiwan.

2.5 | Instruments

2.5.1 | Patient information form

The participants completed a background information form to provide demographic information, such as gender, age, marital status, educational status, employment status, household income, religious beliefs, and treatment with cART.

2.5.2 | Berger's HSS and CES-D

Berger's HSS is a 40-item instrument that assesses HIV-related stigma in adults with HIV infection (Berger et al, 2001). It is scored using a four-point Likert-type scale (1 = strongly disagree, 4 = strongly agree) with two negatively phrased items and total scores ranged from 40 to 160. Higher total scores indicate stronger severity of stigma (Berger et al, 2001).

From an exploratory factor analysis, Berger and colleagues identified 4 factors and 40 scale items: personalized stigma (18 items), disclosure concerns (10 items), negative self-image (13 items), and concerns about public attitudes toward people living with HIV (20 items). Berger's HSS demonstrated good convergent validity, as evident by negative correlations with Rosenberg Self-Esteem Scale (r = −0.60) and O'Brien Social Support Scale (r = −0.54), and positive correlations with CES-D (r = 0.63) and social conflict (r = 0.59). The reliability for the total scale was evident by a coefficient of.96, and a coefficient for the test-retest reliability of 0.92. The Pearson coefficient for the four subscales ranged between 0.90 and 0.93 (Berger et al, 2001).

The CES-D was developed by Radloff (1977) to measure depression in general. The CES-D is a well-established 20-item questionnaire containing four dimensions: depressed affect (8 items), positive affect (4 items), somatic and retarded activity (6 items), and interpersonal relationships (2 items). Items are rated on a 4-point Likert-type scale (0 = rarely or none of the time, 3 = all of the time). The total scores of CES-D range from 0 to 60, with higher scores indicating greater severity of depressive symptoms.

Cronbach alphas for internal consistency were between 0.85 and 0.90. The convergent validity is evident by a positive correlation with the Raskin rating scale (r = 0.54; Radloff, 1977). The CES-D has been translated into Chinese (sensitivity = 92.0%, specificity = 91.0%) to identify depression in the Chinese population (Chien & Cheng, 1985).

2.6 | Data analysis

The authors used SPSS 22.0 for data analyse data, internal consistency and convergent validity, and LISREL 9.2 for Windows for confirmatory factor analysis (CFA). Descriptive statistics were utilized to analyse the demographic characteristics. Data quality was evaluated through analysis of missing values for each item. Where participants had more than 5% missing values, responses were considered attrition and were not included in the analysis. Floor and ceiling effects were assessed by reviewing the distribution of scores of each item. The criterion for determination of floor and ceiling effects was 20%.

Internal consistency was measured using Cronbach alpha (≥0.7 indicating acceptable reliability; Polit & Beck, 2012). Construct validity was evaluated using CFA and convergent validity. CFA with a first-order structure model was used to validate that the Chinese 40-item HIV stigma scale shared the same theoretical construct with the original Berger's HSS on the four factors. The tested goodness-of-fit indicators for the CFA included comparative fit index (CFI), goodness-of-fit index (GFI), adjusted GFI (AGFI), and non-normed fit index (NNFI) of ≥0.90, standardized root mean square residual (SRMR) ≤0.05, the root mean-square-error of approximation residual (RMSEA) of ≤0.05 and model Akaike information criterion (AIC). An AIC value closer to 0 indicates better fit and effectiveness of the model (Grave & Cipher, 2017; Hwang, 2015). Items were deleted based on factor loadings: <0.4 and >0.8 were deleted. Each domain has at least three questions (Chiou, 2010; Hwang, 2015). Convergent validity was examined by performing a correlation analysis between the 18-item CHSS and the CES-D, with a Pearson product moment correlation coefficient of 0.2 to 0.4 indicating acceptable convergent validity (Polit & Beck, 2012). The authors hypothesized that HIV-related stigma would positively correlate with depression.

2.7 | Ethical consideration

After receiving IRB approval, the authors obtained informed consents prior to data collection. The authors approached potential participants at the outpatient infection clinic to explain the purposes and process of the study and informed them of the voluntary and anonymous nature of the study. The individuals who consented to participate completed: (1) a patient information form, (2) the Chinese 40-item HSS, and (3) the CES-D. Data were collected at a private room in the clinic. Each survey took about 15 to 20 minutes to complete.

3 | RESULTS

3.1 | Sample

There were 540 participants with an average age of 29.78 (SD = 7.67) years. The majority of the participants were male (99.4%, n = 537), single (87.6%, n = 473), and held a bachelor's degree (55.6%, n = 300). Eighty-four percent (n = 452) of the participants were receiving cART.

3.2 | Validity analysis

The four-factor CFA measurement model for the 18-CHSS is presented in Figure 1. The CFA was conducted based on four domains of Berger's HSS. The overall model fit primarily evaluates the goodness-of-fit between the conceptual model and observed information, which tested the external quality of the model. Model fit was assessed using GFI, AGFI and RMSEA. Three model testings were conducted.

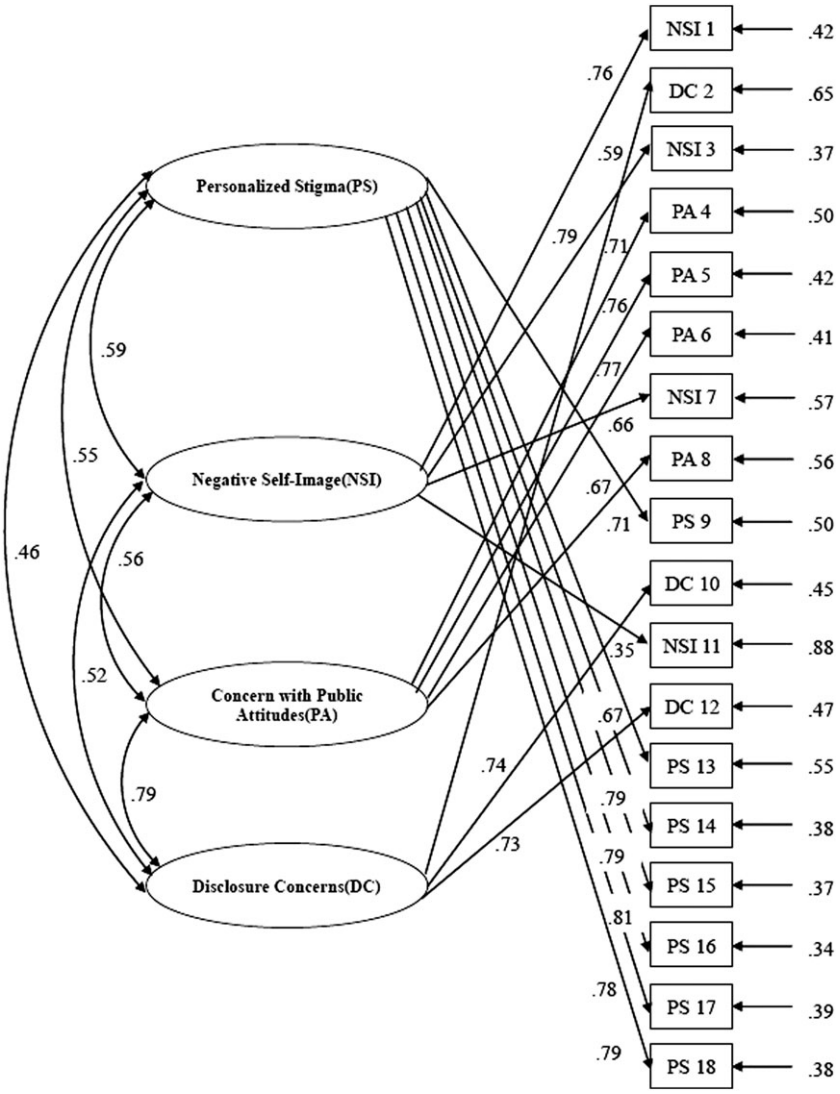

FIGURE 1 Measurement model of the CHSS-18

Model 1 with 40 items showed poor model fit (χ^2 = 51718.39, P < 0.01, GFI = 0.75, AGFI = 0.73, RMSEA = 0.84, and AIC = 3683.02). The corrected item-total correlations that were less than 0.40 (items #1, 8, 21, 37, and 40) were deleted.

However, model 2 (35 items) still showed poor model fit (χ^2 = 46320.32, P < 0.01, GFI = 0.81, AGFI = 0.78, RMSEA = 0.76, and AIC = 2430.06). Subsequently, the authors deleted 22 redundant or ambiguous items (items # 1, 3, 5, 6, 8, 11, 12, 13, 17, 19, 20, 21, 24, 27, 30, 32, 33, 34, 36, 37, 39, and 40) to form model three.

Thus, model 3 contained 18 items and revealed a good model fit (χ^2 = 11399.49, P < 0.01, GFI = 0.94, AGFI = 0.91, RMSEA = 0.55, and AIC = 420.34). The goodness-of-fit statistics for comparative models of the 18-CHSS are presented in Table 1. Each parameter estimation and indices are presented in Figure 1.

The researchers used the 18-CHSS to estimate distribution of factors. The results showed that all 18 items met the factor extraction conditions (skewness: −0.87 to −0.04, kurtosis: −0.74 to 0.82). Absolute values of skewness <3 and absolute values of kurtosis <10

TABLE 1 Goodness-of-fit statistics for comparative models of the 18-CHSS

	RMSEA	RMR	SRMR	GFI	AGFI	NFI	NNFI	PNFI	CFI	IFI	RFI	Model AIC
Model 1	0.084	0.069	0.096	0.75	0.73	0.94	0.95	0.88	0.95	0.95	0.94	3683.02
Model 2	0.076	0.044	0.064	0.81	0.78	0.96	0.96	0.89	0.97	0.97	0.95	2430.06
Model 3	0.055	0.034	0.047	0.94	0.91	0.97	0.98	0.82	0.98	0.98	0.96	420.34

Model 1: 4 factors 40 items.

Model 2: 4 factors, deleted items (items deleted: 1, 8, 21, 37, 40).

Model 3: 4 factors, deleted items (items deleted: 1, 3, 5, 6, 8, 11, 12, 13, 17, 19, 20, 21, 24, 27, 30, 32, 33, 34, 36, 37, 39, 40).

Note. RMSEA = root-mean-square error of approximation, RMR = root-mean-square residual, SRMR = standardized RMR, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, NFI = normed fit index, NNFI = non-normed fit index, PNFI = parsimony-adjusted NFI, CFI = comparative fit index, IFI = incremental fit index and RFI = relative fit index, AIC = Akaike information criterion, AIC.

indicate proximity to normal distribution (Chiou, 2010). Floor effects of the four subscales ranged from 0.2 to 3.3, and ceiling effects ranged from 1.1 to 18.9. Both floor and ceiling effects did not exceed 20%. The results of CFA confirmed 4 factors and 18 items. The four factor domains, which had the same number of factor domains as the original Berger's HSS, included personalized stigma (seven items), negative self-image (four items), concerns with public attitudes (four items), and disclosure concerns (three items).

The results of convergent validity are presented in Table 2. The CES-D scale was used to test convergent validity with the 18-CHSS and revealed a positive correlation (r = 0.404, P < 0.01). There were positive correlations between the 18-CHSS subscales and the CES-D subscales with the correlation coefficients ranging from 0.25 to 0.46. This result indicates a good convergent validity of the 18-CHSS.

3.3 | Reliability analysis

Internal consistency of the 18-CHSS was evident in a Cronbach alpha of 0.92. The alphas of the four subscales ranged between 0.73 and 0.91 (see Table 3). Additionally, there were significant moderate to high correlations among the four 18-CHSS subscales and the overall scale, which demonstrated good internal consistency.

4 | DISCUSSIONS

In summary, Berger's HSS has 40 items and four domains. The cumulative amount of explained variance from the exploratory factor analysis result is 46% (Cronbach alpha = 0.91). As for the 18-CHSS, the number of items was reduced from 40 to 18 and the four domains remained (r = 0.92). Reliability for the 18-CHSS subscales ranged from 0.73 to 0.91. It takes 5 to 10 minutes to complete the 18-CHSS, which is less time consuming and lessens the burden on respondents.

The results of this study may be compared with six studies published between 2007 and 2015 that attempted to simplify Berger's HSS and to test the validity and reliability. Five of the six studies used Berger's HSS for cross-cultural testing. The number of Berger's HSS items (40 items) was reduced to 32 items by Bunn et al (2007), to 21 items by Franke et al (2010), to 25 items by Jeyaseelan et al (2013), and to 12 items by Reinius et al (2017). Our study results also suggested the need for item deletion.

The correlation coefficient was 0.63 between Berger's 40-item HSS and the CES-D, and 0.40 between the CES-D and the 18-item Chinese abbreviated scale. There was a low correlation (r < 0.3) between the 18-item CHSS and the CES-D subscales of "somatic symptoms" and "depressive affect." The low correlation may due to fewer items of the 18-CHSS and the participants' less noticeable symptoms of depression.

In this study, the average stigma score was 51.29 (SD = 9.21, range = 18-72). Five items had the highest average stigma scores: three items pertaining to the "disclosure concerns" domain and two items pertaining to the "concerns with public attitudes" domain. The participants worried about being open about the illness and the consequent public perceptions. They generally felt that stigmatized treatment toward people living with HIV persisted in the community. In the Taiwanese culture, HIV infection is perceived as "family shame." The participants worried that the pressure and discriminatory public perceptions may be unbearable for their family and feared losing their family, intimate relationships and social support, and being marginalized if they disclosed the illness (Chen & Shih, 2010; Chuang & Liu, 1997; Gari & Habte, 2010). These results are consistent with Yang et al's (2007) results and the Chinese concept of "face."

The two negatively phrased items were deleted from the original Berger's HSS because the phrasing, from the Chinese linguistic perspective, could cause confusion for participants. This finding is consistent with the results from Franke et al (2010), Jeyaseelan et al

TABLE 2 Pearson correlation for 18-CHSS and subscales

	CHSS (18 Items)	Subscale 1 Personalized Stigma (7 Items)	Subscale 2 Negative Self-Image (4 Items)	Subscale 3 Public Attitudes (4 Items)	Subscale 4 Disclosure Concerns (3 Items)
CHSS (18 item)	1	0.896**	0.794**	0.764**	0.658**
CES-D scale (20)	0.404**	0.345**	0.434**	0.224**	0.215**
Depressive affect (7 items)	0.281**	0.217**	0.311**	0.156**	0.195**
Positive affect (4 items)	0.462**	0.428**	0.519**	0.243**	0.135**
Somatic symptoms (7 items)	0.254**	0.211**	0.266**	0.144**	0.161**
Interpersonal relations (2 items)	0.362**	0.297**	0.292**	0.199**	0.192**

**Correlation is significant at the 0.01 level (2-tailed).

TABLE 3 Descriptive statistics for the subscales of the 18-CHSS

Dimension (n items)	Range	Mean (SD)	Floor/Ceiling Effect, %	Reliability, Cronbach α
Overall (18)	19-27	51.29 (9.21)	0.8/0.2	0.92
Personalized stigma (7)	7-28	18.69 (4.71)	3.1/1.1	0.91
Disclosure concerns (3)	3-12	9.68 (1.71)	0.2/18.9	0.73
Negative self-image (4)	4-16	10.68 (2.77)	3.3/2.2	0.82
Concerns with public attitudes (4)	4-16	12.24 (2.35)	1.1/8.9	0.82

(2013), and Reinius et al (2017). Furthermore, HIV-related stigma was positively correlated with depression. This finding is consistent with Berger et al (2001) and colleagues' results and results from other studies (Chang, Ko, Lai, & Jeng, 2013; Steward et al, 2008; Steward et al, 2011). The internal consistency of the 18-CHSS (r = 0.92) was acceptable and similar to other language versions of the HIV Stigma Scale (Spanish version = 0.84, Tamil version = 0.88, Swedish version subscale range 0.80 to 0.88; Franke et al, 2010; Jeyaseelan et al, 2013; Reinius et al, 2017).

4.1 | Limitations

The limitations of this study include (1) participants' characteristics: the majority of the participants were male (99.4%); (2) geographical location: only individuals living in Central Taiwan were recruited, which impacted the generalizability of the results; (3) diverse lifestyles; and (4) differences in socioeconomic status. Additionally, drug users were not excluded from this study. The participants were not asked to self-identify if they were drug addicts. Furthermore, all the participants were from the same treatment facility. Due to these limitations, the generalizability of the findings should be considered with caution. Future studies may include participants with diverse demographic characteristics and geographical areas for comparison purpose.

5 | CONCLUSION

In conclusion, the 18-CHSS demonstrated adequate reliability and validity to assess HIV-related stigma of the participants of this study and is an effective tool for rapid assessment of HIV-related stigma in cognitive, emotional, behavioural, and social aspects among the Chinese people living with HIV taking only 5 to 10 minutes to complete. Health-care professionals and nurses can use the 18-CHSS to facilitate detection of cognitive, emotional, behavioural, and social aspects of HIV-related stigma in Chinese people living with HIV. If people living with HIV are experiencing severe stigma, it is important that the health-care team detect this and are aware of the possibilities of associated depression and poor adherence to treatment. Referral for further evaluation and, potentially, treatment of depression may be necessary.

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CONFLICT OF INTEREST

The authors report no real or perceived vested interests that relate to this article that could be construed as a conflict of interest.

AUTHORSHIP STATEMENT

CHY and SFC conception and design of the study. CHY and YTL collection, analysis and interpretation of data. CHY, SFC. and CYH manuscript drafting and revising. All authors read and approved the final manuscript to be published.

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