



The Development and Validation of Multi-dimensional Resilience Scale for People Living with HIV in China

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Abstract

The study aimed to provide a measurement tool for the assessment of resilience among people living with HIV (PLHIV) in China. The study period was from April 2019 to October 2020: first, 14 PLHIV were interviewed to build an item pool; 15 experts were invited to evaluate the scale items. The test–retest reliability of the scale was carried out with 29 PLHIV. Online and field investigation were used, and convenience sampling was conducted in Luzhou and Zigong. A pool of 31 items was formed and the Scale-Level Content Validity Index average was 0.96, while the that intra-class correlation coefficient for test–retest reliability was 0.816. From the exploratory factor analysis, four factors (Acceptance; Disease Management; Emotion Regulation; and Reconstruction) with 19 items were extracted. The Cronbach’s alpha value of the Resilience Scale was 0.88. This scale could prove useful as a measuring tool for evaluating the level of resilience for PLHIV.

Keywords Scale development · People living with HIV · Resilience · Reliability and validity

Resumen

El estudio tuvo como objetivo proporcionar una herramienta de medición para la evaluación de la resiliencia entre las personas que viven con el VIH (PVVIH) en China. El período de estudio fue de abril de 2019 a octubre de 2020: primero, se entrevistó a 14 PVVIH para construir un grupo de artículos; 15 expertos fueron invitados a evaluar los ítems de la escala. La confiabilidad test–retest de la escala se realizó con 29 PVVIH. Se utilizaron investigaciones en línea y de campo, y se realizó un muestreo de conveniencia en Luzhou y Zigong. Se formó un conjunto de 31 ítems y el índice de validez de contenido a nivel de escala promedio fue de 0,96, mientras que el coeficiente de correlación intraclase para la confiabilidad test–retest fue

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de 0,816. Del análisis factorial exploratorio se extrajeron cuatro factores (Aceptación; Manejo de la Enfermedad; Regulación de las Emociones y Reconstrucción) con 19 ítems. El valor alfa de Cronbach de la Escala de Resiliencia fue de 0,88. Esta escala podría resultar útil como herramienta de medición para evaluar el nivel de resiliencia de las PVVIH.

Introduction

HIV has become a preventable and treatable chronic infectious disease due to the wide application of AIDS antiretroviral Therapy (ART) [1]. People living with HIV (PLHIV) still face social discrimination, lifelong medication, opportunistic infections and other troubles, which brings great pain to them and leads to problem such as anxiety, depression and other psychological disorders [2]. These can seriously affect not only the PLHIV's quality of life but also prevention and control of AIDS [3].

In the past, more attention was paid to the negative aspects of the PLHIV while less was paid to the positive adaptation process and their self-growth. Recently, resilience has attracted the attention of researchers in HIV/AIDS. Resilience is a promising construct for researching the health and well-being of PLHIV. A multidimensional resilience concept is variously defined as a set of personality traits protective from mental disorders, as a dynamic process encompassing positive adaptation to challenging life conditions or as a series of individual good adaptation outcomes [4, 5].

Resilience is essential for PLHIV to continue receiving AIDS health care services such as antiretroviral treatment, social and mental health consultation [6, 7]. The resilience of PLHIV will affect their physical and mental health [8, 9], social adaptation [10], the effectiveness of treatment [11], and the prevention and control of AIDS. Therefore, more in-depth study on resilience is needed. A specific measurement tool is very important for studying resilience, which can identify the impact of resilience-enhancing interventions.

The adaptation to HIV can be conceptually parallel to the resilience process among people living with HIV. How PLHIV respond to adversities can drastically differ from one person to another, resulting in Maladaptive, Adaptive, or Reconstruction based on Kumpfer's Resilience Model [12]. The resilience of PLHIV can be considered 'resources' that draw upon multilevel support (i.e., individual, interpersonal, and neighborhood levels) to adapt positively and overcome adversity [13].

At present, studies on resilience measurement tools were apparent in different age groups such as adolescents [14], middle school students [15, 16], adults [17], and empty-nest older people [18]. Similar studies exist in different occupational groups: excellent athletes [19], medical rescue workers [20], crisis rescue workers [21], civil servants [22], as well as different disease groups: inflammatory bowel disease [23], malignant tumor [24], and adolescents with

body surface defects [25]. These scales of resilience which showed a trend of specification in varied kinds of people were not specific to PLHIV.

The Connor-Davidson Resilience Scale-10 item (CD-RISC-10) is a general measure of resilience [26]. It is a widely used to quantify the level of self-perceived resilience, but not specifically for PLHIV. However, PLHIV differ from other people: they undergoing social discrimination and lifelong medication. Therefore, it is necessary to develop a resilience scale with specific connotation and structure for PLHIV in China.

Based on Maslow's hierarchy theory of needs, an unidimensional resilience scale with 10 items for PLHIV in the context of HIV stigma was developed by Gottert [6]. The scale was used for the measurement of a variety of needs and important life goals of PLHIV influenced by stigma, which included self-confidence, and the ability to respect others. Most of resilience scales such as the Resilience Scale for Inflammatory Bowel Disease [23] and the Resilience Scale specific for Cancer [24] are multidimensional. It is meaningful to explore a multidimensional resilience scale for PLHIV, which might deepen the understanding of the unique constructs of resilience. In addition, the cultural backgrounds and policies were different between countries [27], so the responses of PLHIV to the adversities were significantly different. According to the above, it was necessary and important to develop a multi-dimensional resilience scale for PLHIV in China.

Methods

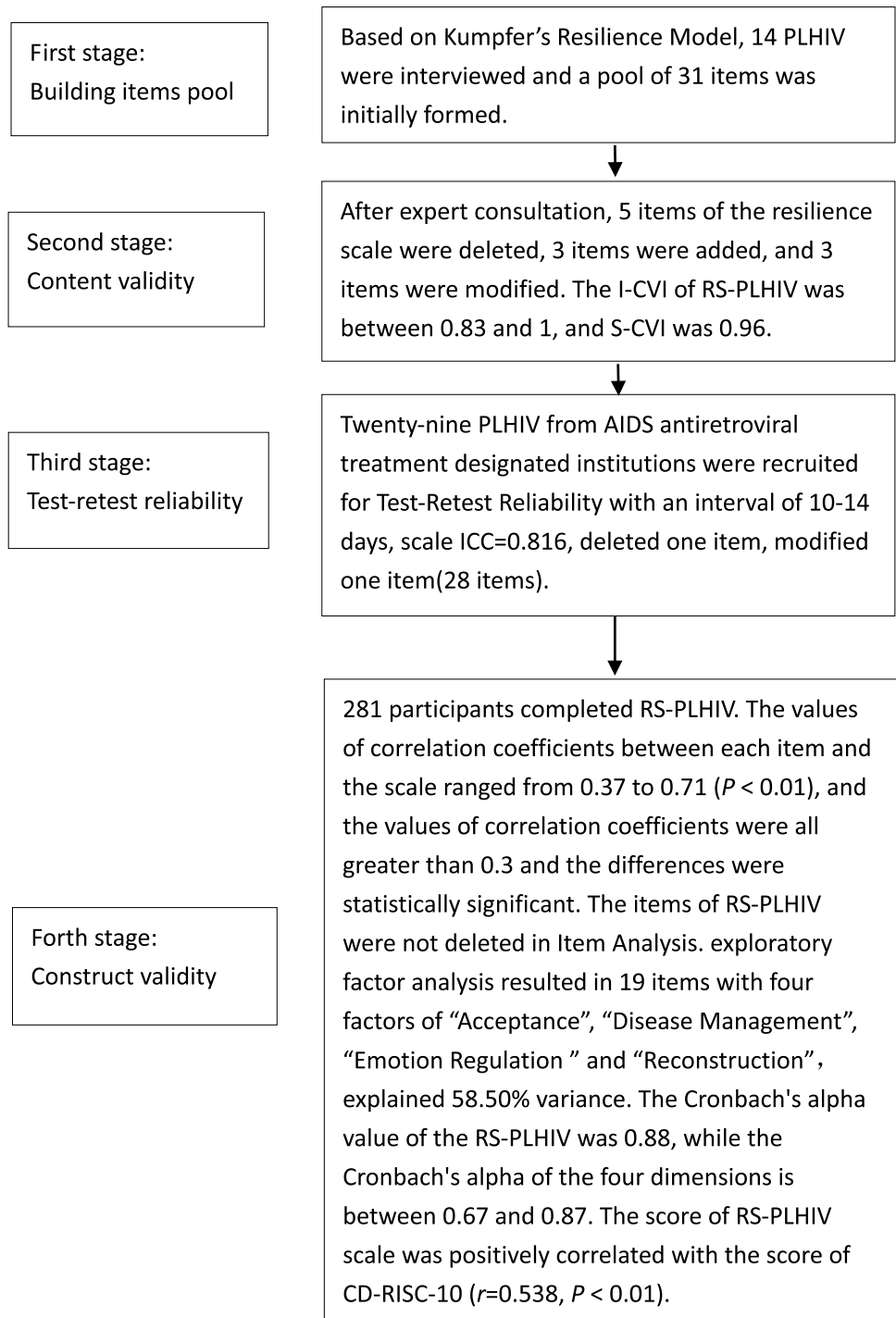
Research Process

This study was divided into four stages (Fig. 1).

Stage 1: From April to July 2019, based on Kumpfer's Resilience Model, 14 PLHIV were interviewed with the purposive sampling. The data of interviews were carefully examined and coded by Chinese, and the resilience scale with 31 items was initially formed in China.

Stage 2: From October to December 2019, 15 qualified experts (four AIDS clinicians, four AIDS clinical nurses, four psychology experts and three PLHIV) who worked in China were invited to modify the items of the resilience scale and evaluate the Content Validity.

Stage 3: In December 2019, the test-retest reliability: the modified scale after expert consultation was used to measure the level of resilience of 29 PLHIV two consecutive times,

Fig. 1 Flow chart of the study

with an interval of 10–14 days. The Intraclass Correlation Coefficient (ICC) was calculated.

Stage 4: From July to October 2020, online and field investigation were conducted by convenience sampling in AIDS antiretroviral treatment designated institutions in Luzhou and Zigong, Sichuan province, China. Structural Validity and Calibration Correlation Validity were tested.

Measurements

The sociodemographic information consisted of age, sex and education of the people living with HIV (PLHIV). The disease-related information consisted of sexual orientation, most likely route of infection, years of diagnosis of PLHIV, years of antiretroviral treatment, and CD4 cell count.

The RS-PLHIV with 28 items developed in this study was used. The scale was rated using Likert level 1–5, ranging from “very inconsistent” to “very consistent”.

The Connor-Davidson Resilience Scale-10 item (CD-RISC-10) has been widely applied in different population [28, 29]. The Cronbach’s alpha was 0.88, and the reliability of the test–retest was 0.73 at a 2-week interval. The CD-RISC-10 is a Likert 4-point scale, ranging from “never” to “almost always” on a scale of 0–4 points, with an overall score of 0–40 points.

The Herth Hope Scale (HHS) was used to test the Convergent Validity [30]. The Cronbach’s alpha value was 0.85. The scale includes 12 items in three dimensions: positive attitude towards reality and future, taking positive actions and maintaining close relationship with others. Items were scored on a Likert 4-point scale, ranging from “strongly disagree” to “strongly agree” on a scale of 1–4 points, with an overall score of 12–48 points.

The Center for Epidemiological Studies Depression Scale (CES-D) was used to test the Divergent Validity. The reliability and validity of the CES-D scale have been verified in the Chinese general version [31]. The Cronbach’s alpha was 0.90. The CES-D scale was scored according to the frequency of the corresponding symptoms of PLHIV in the last 7 days, with a total score of 0–60 points. Someone scoring over 16 points is judged to have depressive symptoms.

Dada Collection Method

Data were collected from through the online and field survey. In the field data collection, on the one hand PLHIV were afraid of being recognized by acquaintances or in haste. On the other hand, due to the COVID-19 pandemic, it was very difficult for PLHIV to access hospitals. Therefore, an online survey was used.

First, the researcher contacted with AIDS prevention personnel in AIDS antiretroviral treatment designated institutions with a letter of introduction and signed a confidentiality agreement.

An online survey tool (Questionnaire Star) was used. The AIDS prevention personnel of each designated institution sent a two-dimensional code to the WeChat® of PLHIV. The respondents voluntarily completed the questionnaire with an informed consent statement. The following quality assurance measures were taken. The only access to the questionnaire was through a two-dimensional code and it could not be found by search engines. The same device (mobile phone, computer) or the same account was used only once to complete it. The verification code was required when submitting the answer sheet.

The Field investigation was conducted in the following two methods: method 1: When the PLHIV got the antiretroviral drugs, AIDS prevention staff collected the data; method

2: The antiretroviral treatment of PLHIV was recommended by AIDS prevention staff, and questionnaires were distributed and collected by the researchers.

Data Analysis

The Content Validity Index (CVI) was used in the content validation with the expert consultation. The criterion for the Item-level Content Validity Index (I-CVI) should not be less than 0.78 when the number of experts is six or more [32]. The test–retest reliability was measured using Intra-class Correlation Coefficient (ICC) [33], and the two way random model of absolute agreement type was used. The ICC of individual item below 0.2 is considered as poor retest reliability [34].

Descriptive statistics of all variables and construct analysis of established scales were performed. Principal component analysis was used with varimax rotation. Eigenvalues greater than 1.0 were used to decide how many dimensions to explore in the RS-PLHIV. Items were deleted according to the following criteria: the factor loading was less than 0.5. The cross loading was greater than 0.3.

Ethical Principles

This study was approved by the Ethics Review Committee of the Affiliated Hospital of Southwest Medical University Institutional Review Board (No: KY2020076). The purpose and significance of the study was introduced to the participants in detail based on informed consent. Before the survey, PLHIV were asked to recall their resilience in the past 12 months. The price of the compensation is 30 RMB per participant in the study.

Results

Content Validity

Item-level Content Validity Index (I-CVI) is equal to the number of experts who considered the item achieved a rating of 3 or 4 divided by the number of all experts [35]. In the average approach, the sum of I-CVIs divided by the total number of items is the Scale-Level Content Validity Index (S-CVI) [36]. In the first expert consultation, based on the I-CVI values (under 0.78), five items were deleted. And considering the actual performance of resilience in PLHIV, the items “I work hard to achieve my goals” and “I influence people around me to prevent AIDS” which have a little lower I-CVI values (under 0.78) were retained. At the same time three items were added and three items were modified, which were proposed by six expert. These items were validated in the second expert consultation. The I-CVIs for

this scale ranged 0.83–1.00. The S-CVI/Ave of RS-PLHIV was 0.96.

Test–Retest Reliability

The Intra-class Correlation Coefficient (ICC) was 0.816, $P < 0.01$. There were two items whose retest reliability ICC was less than 0.2. The item “I integrate into the collective life” was deleted. The other item “I take my medication regularly” in which “regularly” may not been understood very well by ordinary people was replaced by “I insist on taking medicine according to the doctor’s advice.”

Construct Analysis

Descriptive Characteristics

At the fourth stage, a total of 299 questionnaires were collected from July to October 2020. During the survey, 370 questionnaires were distributed, with a response rate of 80.81%. And in the valid data, 281 participants completed RS-PLHIV; 272 of them completed CD-RISC-10 and HHS; 221 of them completed CES-D. The age of PLHIV was 42.59 ± 14.49 years old, and most of them were male (75.09%). The proportion of living in city was 76.16%, higher than PLHIV in rural areas. Most of the PLHIV were employed (56.23%), and 47.68% of them had an annual income below 10,000 RMB.

The Score of Each Item on the Scale

The average score of each item in the RS-PLHIV scale ranged from 3.59 to 4.36. The lowest average score was the item “I am open to discrimination”. The highest score was the item “I insist on regular physical examination” (CD4 cell count or Viral load) (Table 1).

Item Analysis

The correlation between each item scores and the total score of RS-PLHIV was ranged from 0.37 to 0.71 ($P < 0.01$). The $r > 0.3$ and $P < 0.05$ were used as the index for item screening. No item was deleted in the resilience scale for PLHIV.

Exploratory Factor Analysis (EFA)

Suitability of variables to factor analysis is important. If the Kaiser–Meyer–Olkin (KMO) is ≤ 0.50 , it is reported that the data cannot be factored [37]. The KMO score was 0.906 and the Bartlett’s sphericity test ($\chi^2 = 3859.61$, $df = 378$, $P < 0.001$) was statistically significant, which meant the data were suitable for factor analysis.

Eigenvalues indicate that there were five factors in the scale. But the fifth factor had only one item, which was inconsistent with the principle that defining a dimension in a factor analysis need at least three items [38]. After this one was deleted, there were four factors. Meanwhile the scree plot indicated four factors in RS-PLHIV, so the number of extraction factors was four which was set in the Principal Components Analysis. Finally, these factors explained 58.50% of the total variance of RS-PLHIV. The factor loading values of the items ranged from 0.534 to 0.824 (Table 1). The Cronbach’s α of RS-PLHIV was 0.88, and Cronbach’s α values of four dimensions (Acceptance, Disease Management, Emotional Regulation, and Reconstruction) were 0.67, 0.87, 0.73 and 0.76, respectively.

According to repeated explorations, RS-PLHIV consisted of 19 items with four dimensions (Table 1). Factor 1, Acceptance consists of three items. It indicates that PLHIV have a positive understanding of HIV infection and they are open to discrimination. Factor 2, Disease Management consists of seven items including coping with the disease, actively seeking medical help, insisting on taking medication as prescribed by doctors, keeping in good health and so on. Factor 3, Emotional Regulation consists of four items, it indicates that PLHIV maintain a good, stable mood and are full of confidence in the future. Factor 4, Reconstruction consists of five items. It means that PLHIV are grateful to the government and willing to join the anti-AIDS organizations.

Criterion-Related Validity

The results showed that the dimensions of the PLHIV resilience scale was positively correlated with the Connor–Davidson Resilience Scale-10 item (CD-RISC-10) ($r = 0.319–0.538$, $P < 0.01$), which indicated that RS-PLHIV had good Criterion-Related Validity (Table 2).

Convergent Validity

The dimensions of RS-PLHIV were positively correlated with the dimensions of the Herth Hope Scale ($r = 0.275–0.680$, $P < 0.01$), which indicated that RS-PLHIV had good Convergent Validity (Table 3).

Divergent Validity

The PLHIV Resilience Scale was negatively correlated with the dimensions of the Center for Epidemiological Studies Depression Scale ($r = -0.420–0.178$, $P < 0.01$), which indicated that RS-PLHIV had good Divergent Validity (Table 4).

Table 1 The RS-PLHIV factor load matrix of exploratory factor analysis and the items score (n = 281)

Item		Factor loading values				Mean (SD)
English	Chinese	Acceptance	Disease management	Emotional regulation	Reconstruction	
2.I'm just like a normal person	2.我与正常人一样	0.801	0.136	0.116	0.001	3.77 (0.88)
4.I am open to discrimination	4.我坦然面对歧视	0.776	-0.007	0.090	0.147	3.59 (1.03)
3.I still have my own strengths	3.我仍有自己的优点	0.607	0.423	0.069	0.270	3.89 (0.83)
5.I insist on taking medicine according to the doctor's advice	5.我坚持遵医嘱服药	0.044	0.824	0.034	0.091	4.33 (0.73)
6.I insist on regular physical examination (CD4 count or viral load)	6.我坚持定期复查(CD4细胞计数或病毒载量)	0.110	0.811	0.156	-0.042	4.36 (0.72)
10.I insist on living	10.我坚持活着	0.173	0.699	0.322	0.109	4.28 (0.65)
11.I keep in good health	11.我保持身体健康	0.092	0.683	0.257	0.193	4.22 (0.77)
7.I overcame the toxic side effects of antiviral drugs	7.我克服抗病毒药物的毒副作用	0.121	0.667	0.228	0.075	4.24 (0.69)
8.I insist on knowing the relevant knowledge of the disease (such as the latest developments of the disease)	8.我坚持了解疾病相关知识(如疾病的最新动态)	-0.078	0.649	0.174	0.326	4.00 (0.93)
9.I actively seek help from medical staff	9.我积极寻求医务人员帮助	0.143	0.648	0.161	0.253	4.15 (0.79)
17.I divert my attention	17.我转移注意力	-0.032	0.071	0.778	0.172	4.00 (0.79)
21.I am confident in facing the virus infection	21.我有信心面对病毒感染	0.203	0.310	0.646	0.214	4.22 (0.72)
22.I believe the disease will be conquered	22.我相信疾病会被攻克	0.190	0.342	0.639	0.236	4.16 (0.81)
15.I hide my infected identity from harm	15.我隐藏感染者身份避免受伤害	0.098	0.350	0.588	-0.062	4.19 (0.84)
25.I help other infected people	25.我帮助其他感染者	0.037	0.157	0.022	0.775	3.67 (0.91)
27.I am willing to join the anti-AIDS organization when necessary	27.在需要时,我愿意加入防艾组织	0.074	0.034	0.114	0.775	3.69 (0.99)
18.I communicate with my fellow infected	18.我与感染同伴交流	0.060	0.054	0.011	0.680	3.18 (1.09)
26.I share the experience of disease treatment	26.我分享疾病治疗经验	0.162	0.205	0.206	0.619	3.70 (0.90)
28.I influence people around me to prevent AIDS	28.我影响身边的人预防艾滋病	0.082	0.198	0.304	0.534	3.75 (1.00)

Table 2 Correlation between the score of RS-PLHIV scale and CD-RISC-10 r (n = 272)

Dimensions	Acceptance	Disease management	Emotional regulation	Reconstruction	RS-PLHIV total score
CD-RISC-10	0.319*	0.464*	0.505*	0.332*	0.538*

* $P < 0.01$

Discussion

Structure and Content of RS-PLHIV

The items of RS-PLHIV were from in-depth interviews with 14 PLHIV, with 15 multidisciplinary experts' consultation, test-retest with 29 PLHIV, and structure tests with 281 PLHIV. Finally, four factors, Acceptance, Disease Management, Emotion regulation, and Reconstruction were extracted with 19 items.

Table 3 Correlation between the score of RS-PLHIV scale and Herth Hope Scale r ($n=272$)

Dimensions	Acceptance	Disease management	Emotional regulation	Reconstruction	RS-PLHIV total score
Positive attitude towards future and present	0.476*	0.477*	0.483*	0.275*	0.553*
Take positive action	0.442*	0.529*	0.587*	0.376*	0.633*
Maintain close relationships with others	0.484*	0.505*	0.555*	0.300*	0.596*
The score of Herth Hope Scale	0.534*	0.577*	0.621*	0.364*	0.680*

* $P < 0.01$ **Table 4** Correlation between the score of RS-PLHIV scale and the Center for Epidemiological Studies Depression Scale r ($n=221$)

Dimensions	Acceptance	Disease management	Emotional regulation	Reconstruction	RS-PLHIV total score
The score of depression	- 0.420*	- 0.311*	- 0.378*	- 0.178*	- 0.401*

* $P < 0.01$

Factor 1-Acceptance

There were three items included being just like a normal person, opening to discrimination and having strengths. AIDS was traditionally labeled as a “dirty disease” in traditional concepts. Under the pressure of social discrimination and family abandonment, PLHIV usually break down and become sensitive and irritable, even be unwilling to accept healthy living habits style and the quality of their life is significantly reduced. In some extreme circumstances, they took revenge on society and spread AIDS maliciously [39]. As a result, PLHIV may not live life rationally, form irrational cognition, and deny their own advantages, and be unable to accept themselves.

Emlet et al. [40] found that self-acceptance was essential to overcome the negative impact of AIDS discrimination. PLHIV with low resilience are full of fear and anxiety, and it can be difficult for them to accept and adapt to HIV infection [41]. They could have thoughts of ending their lives [42], conducting malicious transmission and other harmful social behaviors. This phenomenon belongs to the maladaptive according to the Kumpfer model [12].

Factor 2-Disease Management

Disease Management is one of the important tasks to make PLHIV's resilience reach the adaptive level according to the Kumpfer model [12]. There are seven items including insisting on regular physical examinations (CD4 cell count or viral load), taking the medicine according to the doctor's advice, and keeping in good health. With good acceptance and disease management, the life of PLHIV could be restored to their pre-infection state.

External support systems, such as seeking help from the medical staff, having an active impact on recovery of

PLHIV. One of the most important items in this dimension is that those who insist on taking the medicine according to the doctor's advice, because most of antiretroviral treatment can rebuild the immune system of patients in general, improve their quality of life, and achieve normal life expectancy [43]. In a designated area, the number of PLHIV treated will affect the infection rate of new patients. It means that if the higher proportion of PLHIV received antiretroviral treatment, the fewer the number of new PLHIV will be [44, 45].

Factor 3-Emotion Regulation

Emotion Regulation is another important task to make the resilience of PLHIV reach the adaptive level [12]. There were four items with diverting attention, managing emotions, and being confident in facing the virus infection. The PLHIV usually hide their HIV infection information to protect themselves from harm. Studies [46, 47] found that positive emotions were beneficial to the health of PLHIV. Emotions have positive and negative sides and are closely related to the social adaptability [48]. Being confident in the disease can help the PLHIV set goals, in turn, the goals may guide them moving forward, controlling emotions with more powerful strength.

Factor 4-Reconstruction

Reconstruction is the peak of resilience of PLHIV, which is the ideal state [12]. There were five items, including helping other infected people, willing to join the anti-AIDS organizations when necessary, and communicating with infected people. The psychological manifestation of reconstruction was that they were grateful to society. Studies have found [49, 50] that they may become a mentor for newly diagnosed PLHIV by mastering knowledge and that they also influence

the thoughts and behaviors of people around them and help other infected people, which is consistent with this study.

A new finding, which was different from the resilience in other countries [40] was that PLHIV took part in the anti-AIDS organizations because they knew the painful life of PLHIV and kept more people far away from AIDS. The policy of “Four Frees and One Care” for HIV in China which was a protective factor in the environment usually makes PLHIV more powerful, helps them resume normal life and achieve psychological growth, and maybe make PLHIV volunteer to take part in anti-AIDS organization. However, in other countries, such as Somalia, PLHIV were driven out by their families and lived in “communities of people living with HIV”.

Reconstruction gives a hint: on the one hand, medical staff should pay attention to the improvement in resilience of PLHIV, give full play to the subjective initiative of them, and enable them to contribute their own strength in the fight against AIDS; on the other hand, AIDS prevention organizations and governmental or non-governmental organizations can absorb PLHIV with a high level of resilience to participate in AIDS prevention activities.

The resilience scale in this study could be used as a guiding framework for coping with AIDS. First, patients accept infection psychologically (Acceptance). Then, PLHIV insist on taking medicine according to the doctor’s advice, and maintain a good health (Disease Management). At the same time, they maintained a good and stable emotions (Emotional Regulation). Finally, PLHIV were grateful for the government’s care and willing to join AIDS prevention organizations to help others (reconstruction).

The Criterion-Related Validity

It was assumed that RS-PLHIV and CD-RISC-10 were highly correlated, but the results showed that they were moderately correlated. It may be that the CD-RISC-10 scale reflects resilience from traits or abilities and it belongs to the general scale. The validation of resilience scale for empty-nest older people [18] and inflammatory bowel disease [23] did not use the general resilience scale (CD-RISC-10) for the Criterion-Related Validity, but the scale for positive psychological quality of “self-efficacy” was used [18, 23]. The next step is to consider the use of self-efficacy related scales as the Criterion-Related Validity.

The Convergent and Divergent Validity

Convergent validity intends to measure the correlation between a new scale and a standard tool assessing a different trait, which is assumed to be correlated with the trait: for instance, life quality may be associated with social support.

Resilience and hope are both positive psychological qualities, so the Herth Hope is assumed to be correlated with the RS-PLHIV. Divergent validity is, on the contrary, to test the correlation between a new trait and a trait which is assumed not to be correlated with, such as resilience is not associated with depression. The correlation coefficient between RS-PLHIV and CES-D was lower than that between RS-PLHIV and The Herth Hope Scale, which indicated that it had a good Convergent and Divergent Validity of the scale.

The Practical Significance of the Scale

RS-PLHIV highlights the positive efforts of PLHIV to adapt to the infection and explores the performance and development process of resilience. Studies have found that their positive cognitive and behavioral responses were conducive to the enhancement of resilience and the health of PLHIV [51]. This measurement tool was consistent with the research from the aspects of Acceptance, Disease Management, Emotional Regulation and Reconstruction [52]. Finally, PLHIV treat AIDS with a positive and optimistic attitude and give back to the society with grateful heart, having safe sex, not spreading the disease and helping others. PLHIV also act as a prevention and control strength, join in AIDS-related organizations and doing things beneficial to society and others.

Medical staff can also use the scale to screen PLHIV with low level of resilience and to implement case management [53], peer education [49, 54]. The scale provides a measurement tool for the evaluation of intervention on resilience of PLHIV. The tool can also serve as a specific intervention framework to help PLHIV recover as soon as possible and improve the quality of their life.

Research Limitations and Recommendations

This study developed and validated the RS-PLHIV in China. The scale has four factors (Acceptance, Disease Management, Emotion Regulation and Reconstruction) with 19 items. The participants were from Sichuan province, and the sample size was relatively small, so the generalizability of RS-PLHIV was limited. If the scale is to be used in other countries, it is necessary to do cross-cultural validation.

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Declarations

Conflict of interest All the authors do not have any possible conflicts of interest.

Ethical Approval Ethical approval was granted by the research ethics committee of the Affiliated Hospital of Southwest Medical University, in China.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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