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A brief measure of perceived courtesy and affiliate stigma on COVID-19: A study with a sample from China

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ABSTRACT

The present study aimed to assist public health efforts by developing and conducting psychometric testing of a brief measure of COVID-19-related stigma among people who were potentially but not necessarily infected. All the items were generated and selected based on extensive literature review, participant interviews, and expert evaluations. The psychometric properties were evaluated through performing confirmatory factor analysis tests, exploratory structure equation modeling, measurement invariance, internal consistency coefficient, composite reliability, and criterion-related validity, using a sample of 2812 adults (600 male, 2212 female; mean age $\mu = 37.23$, SD = 6.17) from Hubei Province, China. A clear two-factor structure of the COVID-19-related stigma among people who were potentially but not necessarily infected (i.e., perceived courtesy and affiliate stigma) was identified through the literature review and interviews. Results suggest that the two-factor model of COVID-19-related stigma (5 items for each factor) model fit the data, and the psychometric properties were acceptable. Measurement invariance across gender was supported. A two-factor 10-item scale was finally obtained.

1. Introduction

On January 30, 2020, the World Health Organization declared Coronavirus disease 2019 (COVID-19) a Public Health Emergency of International Concern which sent the world into a state of emergency. With the high infection rate and increasing mortality, individuals have become fearful of coming in contact with people, places, or things potentially but not necessarily infected with COVID-19, which provokes stigmatization (U.S. CDC, 2020; Lin, 2020).

Stigma is a combination of stereotyping, prejudice, and discrimination (Nicolas Rüsch et al., 2005) and a derogatory and insulting label that makes certain individuals or groups untrusted and unpopular (Goffman, 1968). During the COVID-19 outbreak, stigma has also developed when people have associated COVID-19 with a certain population (U.S. CDC, 2020). For example, those living in Hubei province, the hardest-hit area of China, may experience stigma connected to COVID-19 even though not everyone in Hubei province was infected. As evidenced by previous infectious disease outbreaks (e.g., SARS and Ebola), the co-occurrence of stigma during such outbreaks can harm the health and wellbeing of the infected people as well as their associates (e.g., family, friends, caregivers, and communities) in both internal and external ways (Person et al., 2004).

COVID-19-related stigma can manifest in two ways for Hubei people. First, they have perceived stigmatization, discrimination and even hate from the public. For example, COVID-19 was erroneously associated with Wuhan and with China in public health communication (Nature, 2020), and people with a Hubei ID were labelled “time bombs” (Xu et al., 2021). Hubei people were rejected in interpersonal communication, were evicted by landlords and hotels, and were refused employment. Goffman (1963) has named stigma-in-association as courtesy stigma, which refers to the perceived and experienced stigma of the associates from the general public toward themselves. Courtesy stigma may affect family members, friends, and even professionals who work with the person (Birenbaum, 1970, 1992). Second, amid the peak outbreak of the...
pandemic, the Hubei people lived their daily lives under a social climate that was rife with the courtesy stigma against them. Residents of Hubei likely internalized the socially generated stigmatized interpretations surrounding Hubei identity, resulting in internal self-devaluation (Frost, 2011). The internalization of stigma among associates of devalued characteristics has been defined as "affiliative stigma," which describes the level of self-stigmatization and the corresponding cognitive (e.g., low self-worth), affective (e.g., feeling shame), and behavioural reactions (e.g., self-denigration) of the associates (Mak & Cheung, 2008; Mitter et al., 2019; Shi et al., 2019).

Goffman (1968) characterized stigma into three types (p. 14). Physical deformity, deviation in personal characteristics, and "tribal stigma" (e.g., race, nationality, religion). However, previous research paid more attention to the first two types of stigma, leaving the concept of courtesy and affiliative stigma caused by associations between infectious diseases and geographic areas less explored. Regional discrimination, which takes the form of discrimination against a social group based on its members’ place of origin (Zhang, 2013), is pronounced during the COVID-19 outbreak. Therefore, the present study aimed to add new evidence to the literature by addressing self-perceived courtesy stigma and affiliate stigma caused by geographic linkages of Hubei people who were potentially but not necessarily infected with COVID-19, which also corresponds to the "tribal stigma".

Though health sectors and professionals have advocated for anti-stigma programs (Ahorsu et al., 2020; Lin, 2020; Logie & Turan, 2020), most public health responses to COVID-19 focus on COVID-19 containment (Ahorsu et al., 2020). Current recommended COVID-19 responses such as physical distancing and travel restrictions help with COVID-19 containment. These public health responses, on the other hand, could facilitate COVID-19-related stigma (Logie & Turan, 2020). For example, physical distancing may exacerbate avoidance and reduce interaction with stigmatized persons. Some health professionals have called for balancing tensions between COVID-19 public health responses and stigma-reduction strategies (Logie & Turan, 2020; Xu et al., 2021).

Developing a standardized, reliable, and validated psychometric instrument is an essential phase of intervention research on health promotion and should be positioned as an early stage (Sallis et al., 2000). Unless information about COVID-19 stigma is assessed by valid tools, health professionals will be unable to rapidly evaluate health needs and provide appropriate psychological and behavioural interventions. Therefore, we aimed to design an instrument which assesses the COVID-19-related stigma among people who were potentially but not necessarily infected with COVID-19.

Moreover, COVID-19-related stigma might be different between genders. Previous studies showed that stigma and its management strategies varied with gender (Lee et al., 2005). HIV-related stigma was significantly correlated with gender discrimination (Logie et al., 2013). Pathogen disgust sensitivity predicted greater obesity stigma for women (Lieberman et al., 2012). Thus, a cross-group comparison of the factor model was conducted to test the gender differences to test the stability of the factor model due to the possible gender difference of COVID-19-related stigma.

2. Material and methods

2.1. Item selection

Item selection was carried out in three ways. First, a multidiscipline research group (comprised of researchers in social work, sociology, and education) conducted an extensive review of the stigma literature (e.g., Goffman, 1963; Chang, 2009; Green, 2007; Perkins et al., 2002; Berger et al., 2001; Mak & Cheung, 2008; Liu et al., 2014; Ntswane & van Rhyn, 2007). Perceived courtesy stigma was selected from a subscale of the revised HIV Stigma Scale (Berger et al., 2001) and adapted to the context of COVID-19. The measure of affiliate stigma was adapted from a subscale of the Chinese Courtesy Stigma Scale, which was designed to measure the stigma perceived by people who lived with HIV patients (Liu et al., 2014). Finally, 15 items compiled from existent measures were selected to assess the COVID-19-related stigma after the literature review and experts’ discussion.

Second, we conducted cognitive interviews, asking four questions: (1) Do you understand this item or not? (2) What did you think about when you first read this item? (3) Do you understand the description of response choices in the questionnaire? (4) Could you select a response choice reflecting your true opinion on this item? Twelve items remained based on the feedback from the participants.

Third, potential items from the literature review, interview results, and practical experiences were pooled. After two rounds of discussion among the research group, a two-factor 10-item COVID-19-related stigma scale (Appendix) was retained for measuring courtesy and affiliate stigma. The translation was conducted via a forward-and-back translation process to guarantee that the translated version could be fully understood in the Chinese language. Some items were modified to fit the context of COVID-19.

2.2. Participants and procedure

A total of 2812 adult participants located in Hubei Province, China, during the COVID-19 outbreak (600 male, 2212 female; mean age = 37.23, SD = 6.17) voluntarily took part in the online investigation. The data were collected from January 31 to February 8, 2020 in Mainland China. All participants were recruited by convenience sampling through public social media, which is a typical method in studies on public health emergencies (Erggal et al., 2018; Maity et al., 2015). The inclusion criteria for participants were: a) residence in Hubei with Internet Protocol addresses showing in Hubei province; b) identifying oneself as Hubei people; c) over 18 years. Those who were being treated for, presumed to be infected with, or have recovered from COVID-19 were not included. Informed written consent was obtained when participants clicked the AGREE button before the completion of the investigation. Participants did not receive any incentive.

2.3. Measures

The COVID-19-related stigma scale consists of the perceived courtesy stigma subscale and affiliate stigma subscale. Perceived courtesy stigma refers to the stigma perceived by people who are associated with COVID-19 (e.g., by geographic linkage). Affiliate stigma is the associates' internalization and psychological responses to perceived courtesy stigma. Perceived courtesy stigma was assessed using 5 items selected from a subscale of the revised HIV Stigma Scale (Berger et al., 2001). Affiliate stigma was measured by other 5 items adapted from the subscale (i.e., self-perceived stigma) of the Chinese Courtesy Stigma Scale, which was designed to measure stigma perceived by people who have an undesirable attribute (e.g., people who live with HIV patients) (Liu et al., 2014). A 4-point Likert scale (1 = strongly disagree to 4 = strongly agree) was used to ask the extent to which responders agreed with each statement, with a higher score indicating a higher level of courtesy stigma.

Self-efficacy was measured by four items adapted from (Yoo et al., 2016). Participants indicated their belief in their ability to respond to COVID-19 on a five-point scale (1 = strongly disagree to 5 = strongly agree). Responses were averaged to create a scale with higher scores indicating higher levels of self-efficacy for COVID-19.

Anxiety control was measured by a subscale of the Anxiety Control Questionnaire (Brown et al., 2004), a 15-item, 9-factor instrument assessing an individual's emotion control, threat control, stress control over anxiety and anxiety-related events. The subscale of threat control was selected, which includes 6 items whose content bears on the belief that the occurrence of or escape from frightening events is out of one's control. A 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) was used to ask the extent to which responders agreed with each
statement, with a higher score indicating a lower level of anxiety control.

Risk perception was assessed by eight items adapted from a previous measure in the context of the MERS-CoV outbreak (Yoo et al., 2016). Participants reported their perceptions of COVID-19-related risk perceptions on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) with a higher score indicating a higher level of perceived risks.

Life quality was assessed by seven items adapted from the Quality of Life Enjoyment and Satisfaction Questionnaire (Ruggeri, 2007). A 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) was used to ask the extent to which responders agreed with each statement, with a higher score indicating a higher level of quality of life.

2.4. Data analyses

As we identified two clear dimensions of COVID-19-related stigma among individuals who were potentially but not necessarily infected with COVID-19, we conducted both confirmatory factor analysis (CFA) and exploration structure equation modeling (ESEM) in the current sample to test the structural validity of the proposed two-factor COVID-19-related stigma scale. ESEM could indicate a better model-data fit and more accurate inter-factor correlations than CFA (Marsh et al., 2011; Marsh et al., 2013). The target rotation of ESEM was employed as suggested by Marsh et al. (2014, p. 90) that target rotation is “particularly appropriate when there is a clearly defined a priori factor structure”. Root mean square error of approximation (RMSEA) < 0.08, Tucker-Lewis index (TLI) > 0.90 and comparative fit index (CFI) > 0.90 were used as the evaluation criteria indicating acceptable model fit (Schumacker & Lomax, 2010). For investigating measurement invariance across gender, each gender group was individually tested for goodness of fit, and then a series of increasingly restrictive measurement invariance tests was performed to establish configural, metric, and scalar invariance (e.g., Chen, 2008; Cheung & Rensvold, 2002). The internal consistency reliability was calculated using composite reliability (rho (p)) (Raykov, 1997), and the coefficient of the retest reliability was calculated using the internal consistency coefficient (ICC). Pearson’s correlations were calculated to assess criterion-related validity among the COVID-19-related stigma, self-efficacy, anxiety control, risk perception, and quality of life. Data analyses were conducted using Mplus 22.0.

3. Results

3.1. Factorial structure

We initially computed the CFA model. The results of CFA showed that the model did not fit very well in RMSEA: χ² (44) = 1608.898, RMSEA (90% CI) = 0.112 (0.108, 0.117), CFI = 0.937, TLI = 0.921. We then employed ESEM with target rotation, the results of which showed that the 10-item two-factor structure achieved adequate fit: χ² (25) = 515.001, CFI = 0.980, TLI = 0.964, RMSEA (90% CI) = 0.083 (0.077, 0.090). All items of courtesy and affiliate stigma had salient loadings on their target factors (Table 1). Standardized path coefficients are shown in Fig. 1.

3.2. Measurement invariance

The baseline ESEM model was tested separately in each gender group. The model fitted the data very well in females (χ² = 94.569, p < .001, RMSEA = 0.092, CFI = 0.976, TLI = 0.957, SRMR = 0.018) by adding a covariance between items a1 and a2 as suggested by modification indices. In the same way, we found that the model fit was also satisfactory in males (χ² = 94.569, p < .001, RMSEA = 0.068, CFI = 0.987, TLI = 0.977, SRMR = 0.014). The results indicated that the scale had the same factor structure in both groups. The added covariance (a1 with a2) was retained in the model for females and males in the consecutive analyses.

Note. CS = Courtesy stigma; AS = Affiliate stigma; ESEM = Exploration structural equation modeling.

Factor loadings above .40 are in bold.

|        | CFA          | ESEM          |
|--------|--------------|---------------|
| CS 1   | 0.877**      | 0.695**       | 0.209*        |
| CS 2   | 0.877**      | 0.885**       | -0.005        |
| CS 3   | 0.915**      | 0.913**       | 0.003         |
| CS 4   | 0.866**      | 0.894**       | -0.034*       |
| CS 5   | 0.866**      | 0.807**       | 0.086**       |
| AS 1   | 0.755**      | 0.283**       | 0.456*        |
| AS 2   | 0.874**      | 0.190**       | 0.676*        |
| AS 3   | 0.770**      | -0.044*       | 0.861**       |
| AS 4   | 0.836**      | 0.001**       | 0.900**       |
| AS 5   | 0.853**      | 0.311**       | 0.614**       |

3.3. Internal consistency and retest reliability analysis

The composite reliability of each subscale (Affiliate stigma: p = 0.904; Courtesy stigma: p = 0.940) indicated good internal consistency reliability of each subscale. Results of the retest reliability analysis of each subscale based on the interclass correlation coefficient (ICC) are also satisfactory (r = 0.839 to 0.906; p < .01) (Table 3).

3.4. Criterion-related validity

Criterion-related validity was supported by the significant associations between the COVID-19-related stigma scales and the measures of self-efficacy (Courtesy stigma: r = -0.12, p < .01; Affiliate stigma: r = -0.12, p < .01), anxiety control (Courtesy stigma: r = 0.29, p < .01; Affiliate stigma: r = 0.29, p < .01), risk perception (Courtesy stigma: r = 0.12, p < .01; Affiliate stigma: r = 0.12, p < .01), and quality of life (Courtesy stigma: r = -0.21, p < .01; Affiliate stigma: r = -0.18, p < .01) (Table 4).

4. Discussion

The current study aimed to develop a brief measure of COVID-19-related stigma to assess perceptions of COVID-19-related stigma among people who were potentially but not necessarily infected by
Results suggest that the two-factor model of COVID-19-related stigma (5 items for each factor) model fit the data, and the psychometric properties were acceptable. Measurement invariance across gender was supported.

This article highlighted the issue of being subjected to stigma due to geographic links to COVID-19. Our study resonated with Lin’s (2020) observation of the phenomenon of mutual discrimination, whereby each person who was at the hardest-hit area of the COVID-19, whether infected or not, had the potential of being at the bottom of the discrimination chain. Future studies and practices can extend the perspective to a larger group of the implicated population.

Our study provides a brief and easy-to-administer tool assessing region-related perceived courtesy and affiliate stigma during the COVID-19 outbreak. There are many reliable and valid measures of disease-related stigma which either measure courtesy and affiliate stigma caused by interpersonal connections (Berger et al., 2001; Liu et al., 2014) or stigma experienced and perceived by patients and survivors (James et al., 2020; Person et al., 2004). However, these tools did not directly measure COVID-19-related stigma among Hubei people because the perceived courtesy and affiliate stigma of Hubei people stemmed from geographical links. Therefore, we hope that our research can provide reliable tools for managing public health emergencies and dealing with COVID-19-related stigma issues among diverse populations, such as the stigma inflicted by some non-Hubei Chinese onto Hubei residents, by some Hong Kong and Taiwan residents onto mainland Chinese, and by some Westerners toward overseas Chinese during the COVID-19 outbreak (Xu et al., 2021). Furthermore, our tools can serve as a reference for developing courtesy and affiliate stigma related to “regional discrimination”, which occurs when individuals from some

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**Table 2**

| Model | χ² | Df | CFI | RMSEA | ΔCFI | ΔRMSEA |
|-------|----|----|-----|-------|------|--------|
| M1    | 643.540 | 68 | 0.977 | 0.078 | –     | –      |
| M2    | 620.072 | 66 | 0.978 | 0.077 | M2-M1 0.001 | –0.001 |
| M3    | 628.637 | 74 | 0.978 | 0.073 | M3-M1 0.001 | –0.005 |

Note. All χ² values are significant at p < .001.

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**Table 3**

| Variable | Mean | SD | Skewness | Kurtosis | Factor Loadings | Composite Reliability | Retest Reliability |
|----------|------|----|----------|----------|-----------------|-----------------------|---------------------|
| CS 1     | 1.605 | 0.784 | 1.201 | 0.848 | 0.758 | 0.940 | 0.906** |
| CS 2     | 1.876 | 0.911 | 0.64 | -0.671 | 0.856 | | |
| CS 3     | 1.702 | 0.85 | 1.022 | 0.206 | 0.877 | | |
| CS 4     | 1.855 | 0.893 | 0.669 | -0.582 | 0.861 | | |
| CS 5     | 1.636 | 0.803 | 1.164 | 0.739 | 0.824 | | |
| AS 1     | 1.861 | 0.887 | 0.722 | -0.386 | 0.708 | 0.904 | 0.839** |
| AS 2     | 1.68 | 0.775 | 1.011 | 0.573 | 0.820 | | |
| AS 3     | 1.479 | 0.655 | 1.392 | 2.127 | 0.836 | | |
| AS 4     | 1.498 | 0.666 | 1.381 | 2.144 | 0.845 | | |
| AS 5     | 1.556 | 0.72 | 1.263 | 1.375 | 0.728 | | |

Note. CS = Courtesy stigma; AS = Affiliate stigma; *p < .05. **p < .01.
areas are subjected to higher levels of negative stereotyping (Peng, 2020).

As behaviours are better defined and measured, relationships to health outcomes can be specified more clearly through analyses using more refined measures or subcomponents of behaviours (Sallis et al., 2000). Hence, the present study can also be helpful in the development and implementation of stigma reduction interventions in the way of providing a measurement tool for future studies to explore of the risk factors for COVID-19-related stigma. Our results showed that self-efficacy, anxiety control, quality of life, and risk perception are correlated with COVID-19-related stigma, which is similar to a previous study that found perceived COVID-19 societal stigma was associated with higher symptom severity (Sun et al., 2021). Also, some longitudinal studies have shown that, for example, the severity of the COVID-19 outbreak indirectly affect negative emotions by affecting sleep quality (Zhang et al., 2020). Senior students with suspected or confirmed cases in their community and COVID-19 related worries were found to have a higher risk of developing mental health problems (Li et al., 2021). Thus, in addition to increasing the public's knowledge of COVID-19 and spreading positive messages (Lin, 2020), intervention designers can consider the factors (e.g., self-efficacy) as active components to reduce the negative effects of stigma. Nevertheless, longitudinal studies are needed to test the causal relationship founded in our study.

Limitations should be noted. First, cross-sectional data limited our ability to test the stability of the COVID-19-related courtesy and affiliate stigma scale over time. Second, it is not clear whether the sample experiences low, medium or high levels of stigma. Recent studies use this measurement to indentify different profiles of COVID-19-related stigma (Duan et al., 2020). However, there still needs to be a formal use of this measurement tool to assess the different degrees of stigma and its impact on individuals' mental health in a different settings. Last, the current study has examined limited aspects of the psychometric properties; other properties such as predictive validity and content validity should be investigated in future studies.

5. Conclusion

The COVID-19-related stigma scale showed acceptable psychometric properties. Despite some limitations, we hope the COVID-19-related stigma scale can be used to assist public health efforts in the worldwide battle against COVID-19.

CRediT authorship contribution statement

Tingting Li conceived and designed the study, analyzed the data, wrote the paper, and prepared figures and/or tables. He Bu performed the procedure, reviewed drafts of the paper, and participated in recruitment. Wenjie Duan conceived and designed the study, contributed to reagents/materials/analysis tools, and reviewed drafts of the paper.

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Ethical statement

Ethics approval was obtained from the Human Subjects Ethics Sub-Committee of School of Social and Public Administration, East China University of Science and Technology.

Appendix

Items of courtesy and affiliate stigma

| Courtesy stigma                                                                 |   |
|--------------------------------------------------------------------------------|---|
| 1. Because the COVID-19 outbreak took place in Wuhan/Hubei, most people think that Wuhan/Hubei Ren are disgusting. |   |
| 2. Because the COVID-19 outbreak took place in Wuhan/Hubei, Wuhan/Hubei Ren are rejected when others learn that they are Wuhan/Hubei Ren. |   |
| 3. Because the COVID-19 outbreak took place in Wuhan/Hubei, most people regard Wuhan/Hubei Ren as a plague. |   |
| 4. Because the COVID-19 outbreak took place in Wuhan/Hubei, most people are uncomfortable around someone from Wuhan/Hubei. |   |
| 5. Because the COVID-19 outbreak took place in Wuhan/Hubei, most Wuhan/Hubei Ren are treated as outcasts. |   |

| Affiliate stigma                                                                  |   |
|-----------------------------------------------------------------------------------|---|
| 1. Because the COVID-19 outbreak took place in Wuhan/Hubei, I feel estranged by people around me. |   |
| 2. Because the COVID-19 outbreak took place in Wuhan/Hubei, I feel blamed by people around me. |   |
| 3. Because the COVID-19 outbreak took place in Wuhan/Hubei, I feel ashamed and self-blame. |   |
| 4. Because the COVID-19 outbreak took place in Wuhan/Hubei, I feel people will no longer see my strong point. |   |
| 5. Because the COVID-19 outbreak took place in Wuhan/Hubei, I feel discriminated and people kept away from me. |   |

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