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## Letter to the Editor



## Perceived discrimination and mental health among the Chinese diaspora during COVID-19

The novel coronavirus disease 2019 (COVID-19) has had a major impact on people's mental well-being. During this public health crisis, the Chinese diaspora is likely to be among the more distressed population, subjected to rising racial discrimination presenting as social avoidance or rejection, verbal abuse, and physical violence, which could exacerbate the impact of the COVID-19 pandemic on their mental health, undermine pandemic control efforts and affect the globalized society profoundly. Therefore, there is an urgent need for prompt research and interventions regarding the mental health issues (namely, anxiety and depression) among the Chinese diaspora during the COVID-19 pandemic and its association with discrimination.

The present work was done during the initial escalating phase of COVID-19 pandemic, which was a critical time point in the change of attitude towards ethnical minorities, such as Chinese. The current cross-sectional online survey was carried out using a combination of snowball and random sampling through social media and email lists, to collect samples of Chinese descent who resided in a country outside of mainland China during the survey period from all continents (except for Antarctica) between April 22nd and May 9th, 2020. Perceived discrimination, anxiety and depressive symptoms were collected using the modified Everyday Discrimination Scale (EDS) (Short Version) (Sterthal et al., 2011) (Cronbach's  $\alpha = 0.77$ ; KMO = 0.856), 2-item Generalized Anxiety Disorder Scale (GAD-2) (Kroenke et al., 2007) (Cronbach's  $\alpha = 0.830$ ) and the Patient Health Questionnaire-2 (PHQ-2) (Kroenke et al., 2003) (Cronbach's  $\alpha = 0.753$ ). Additionally, sample's socio-demographic information (gender, age, place of residence, educational level, employment, marital, and immigration status, acculturation level by language use and interpersonal adjustment), and participants were assigned a 0–100 stringency index on April 22nd calculated by the Oxford COVID-19 Government Response Tracker (OxCGRT) (Hale et al., 2020) corresponding to the policy stringency in their country of residence, which quantified government responses including stay-at-home requirements and policies limiting daily activities. The procedure was approved by the ethics committee of Wenzhou Medical University.

705 valid questionnaire responses were analyzed using SPSS 22.0. Participants who scored 0, 1–5, and 6 or higher in EDS represent “never”, “mild discrimination”, and “high discrimination” groups, respectively (Chau et al., 2018). We measured respondents' level of anxiety and depression using GAD-2 and PHQ-2, and separate scale scores of 3 or greater are diagnostic of likely anxiety or depression (Lowe et al., 2010). Multivariable logistic regression analysis were performed with all independent socio-demographic variables or any variable having a statistical significance at some arbitrary level of the previous univariate test ( $P < 0.25$ ) (Bursac et al., 2008). The goodness of fit of regression models was assessed by Hosmer-Lemeshow test. Subsequently, results yielded by a better-fitted model were adopted. The

significance level was set at  $p < 0.05$ .

Among respondents, 52.3 % were males, 46.0 % were aged 18–25 years, 78.0 % of them had received some post-secondary education, 52.9 % were single, 36.5 % were married or living with a partner, 41.7 % were students, and 29.4 % were employed full-time. Of all respondents, 30.8 % were living in the U.S., 25.8 % were living in Spain. The rest were from Japan, the U.K., Australia, etc., totaling 35 countries across all continents (except for Antarctica). 82.6 % (45.8 %, mild; 36.7 %, high) of participants reported they have encountered some form of discrimination in everyday life since the COVID-19 outbreak, which was a higher rate than that prior to the outbreak (Chau et al., 2018). Also, the findings suggested 29.8 % and 25.5 % of participants were likely to have anxiety and depressive disorders, which was significantly more prevalent when compared with rates in Chinese Americans prior to the pandemic (Zhang et al., 2013). When better-fitted multivariate logistic models were adopted (“Anxiety” regression model with all independent socio-demographic variables and perceived discrimination; “Depression” regression model with educational level, preferred language use, friends in country of residence and perceived discrimination), participants in the “high” discrimination group were approximately 5 times more likely to have anxiety disorder (OR, 4.60; 95 % CI, 2.44–8.66;  $P < 0.001$ ) and depression (OR, 4.99; 95 % CI, 2.61–9.53;  $P < 0.001$ ), compared with participants in the “none” discrimination group, controlling for included potential influencing factors (Chen et al., 2020). This correlational relationship between perceived discrimination and the decline of mental health status among the Chinese diaspora during COVID-19 warrants immediate attention and intervention.

It is important to note that the profound effects of social discrimination and marginalization may persist even after the COVID-19 pandemic is over. Although this study has several limitations (sample coverage, limitations related to study design, and self-report nature), the findings provides important data in support of immediate and long-term interventions to combat anti-Asian (and particularly anti-Chinese) racism, and to provide timely mental health care during and after the COVID 19 pandemic, which also constitutes an important part of public health measures in the COVID-19 pandemic response.

## Author contributions

Youli Chen: The conception and design of the study, acquisition of data, analysis, interpretation of data and drafting the article.

Zicong Wang: Acquisition of data, drafting the article.

Weizhen Dong: The conception and design of the study, acquisition of data, revising the article for important intellectual content.

Jia Huei Chen Xu, Sizhe Ji Wu: Acquisition of data.

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