ELECTRONIC SUPPLEMENTARY FILE 2 (ESF2)

Predictors of increased affective symptoms and suicidal ideation during the COVID-19 pandemic: a large-scaled study on 14,271 Thai adults.

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ESF2, Statistics

Principal component analysis (PCA) was used to reduce the number of items to one Principal Component (PC) and the PC score was then used in other statistical analyses. The factorability was evaluated using the Kaiser-Meyer-Olkin (KMO) test for sample adequacy[19], which is considered adequate when > 0.6, and the Bartlett's sphericity test [20]. Only if the variance explained (VE) is greater than 0.50 and all loadings on the first PC are greater than 0.7% is the first PC accepted as a validated latent construct. Nevertheless, we may accept a loading of < 0.7 but > 0.6 for one indicator when the other indicators load highly and the factor quality data are excellent (VE and Cronbach's alpha see below). As such, the items in such a PC may be regarded as reflective manifestations of the latent construct. [15,18]

ESF1, Table 4 demonstrates how we computed the main indices used in the current study, namely the generalized (G) affective symptoms (AS) PC scores during the pandemic (intra-pandemic G-AS), and the pre-pandemic G-AS PC scores, reflecting the participant's estimated scores before the pandemic. Briefly, PCs were extracted from the two depression, two anxiety, four PTSD, two OCD, and the mood swing scores. We were able to extract validated and replicable PCs from those ratings in both pre-pandemic and intra-pandemic conditions, and these constructs, therefore, reflect generalized indices of affective symptom severity. Suicidal ideation did not belong to the G-AS construct (it did not load highly enough on the constructs), and were, therefore, evaluated separately. Subsequently, we calculated the pre-pandemic and intra-pandemic G-AS PC (latent variable) scores and utilized them in various analyses.

To investigate the causal relationships between the pandemic and non-pandemic predictors of intra-pandemic increases in affective symptoms, we utilized partial least squares (PLS) analysis, using the SmartPLS software[21]. This method combines the construction of latent vectors underpinning related indicators (e.g., the G-AS factor) and the regression of the constructed factors on different prespecified explanatory variables. The indicators were selected, based on a theoretical background, as follows: a) the output variable was a latent vector extracted from the item scores of 11 items, which reflect the intra-pandemic affective complaints, namely anxiety, depression, OCD, PTSD, and mood swings; and b) direct explanatory variables were a latent vector extracted from 5 baseline item scores on affective complaints of anxiety, depression, OCD, PTSD, and mood swings, other pandemic-related (e.g., feeling isolated) and non-pandemic-related (e.g., adverse childhood experiences). Moreover, adverse childhood experiences were allowed to predict some indicators as shown in ESF2. Figure 6.

Complete PLS analysis was conducted only when the outer and inner models satisfied the following predetermined quality criteria. All loadings on the extracted latent vectors are greater than 0.667 at $p < 0.001$; a) the latent vectors exhibit high construct and convergence validity, as indicated by Cronbach's alpha > 0.7, composite reliability > 0.8, and average variance extracted (AVE) > 0.5; the model fit is adequate with standardized root squared residual (SRMR) < 0.08; and confirmatory tetrad analysis (CTA) demonstrates that the factors extracted from the indicators are not misspecified as a reflective model. In addition, blindfolding should indicate that the factor's cross-validated redundancy is sufficient. As a result, we conducted PLS analysis using 5,000 bootstrap samples and estimate the total effects, the indirect effects and the specific indirect effects, as well as the path coefficients (with p-values).

ESF2, Results

Results of multivariable statistics

To determine the cumulative effects of the best predictors of the pandemic G-AS scores, we employed multiple regression analyses and included all variables assessed in the current study if there was any theoretical basis that they could explain affective symptoms. ESF3, Table 6 shows that 75.6% of the variance in the pandemic G-AS score was explained by the combined effects of baseline G-AS scores, the combined effects of adverse childhood experiences + negative life events, feeling isolated, being a student, physical pain symptoms, number of medical diagnoses, and fear of COVID (all positively correlated), and age, social support, and family involvement satisfaction (all negatively correlated). ESF3, Table 7 shows that 23.3% of the variance in pandemic suicidal ideation was explained by the number of mental disorders, feeling isolated, sum adverse childhood experiences and negative life events, baseline G-AS, fear of COVID, body mass index, financial loss, and physical health (all positively correlated), and the availability of protective devices, age, and social support (all inversely associated). The latter regression analysis was adjusted for effects of the fourth wave.

Using multiple regression analyses, we also identified the most significant mental and physical disorders associated with elevated pandemic G-AS levels. 2.5% of residualized pandemic G-AS scores (effects of baseline G-AS are accounted for) were explained by (in descending order of significance) major depression, generalized anxiety disorder, PTSD, panic disorder, and anorexia nervosa ($F = 50.74$, $df = 5/9884$, $p < 0.001$). Similarly, 1.6% of the residualized G-AS score variance was explained by (in descending order of importance) migraine, allergies, asthma, peptic ulcer, chronic skin disease, and chronic abdominal pain ($F = 26.09$, df-6/9883, $p < 0.001$).

PLS analysis

To decipher the effects of adverse childhood experiences on the changes in the pandemic G-AS score, we performed PLS analysis with the variables shown in ESF1, Table 6 (and related variables) as direct explanatory variables of the pandemic G-AS score, and adverse childhood experiences as a potential input variable for all the other variables (except age and the waves). The fourth wave was entered as a single indicator to adjust for possible differences in the effects of the waves on G-AS. ESF3, Figure 6 depicts the entire model and demonstrates that the model quality data were more than sufficient. The final PLS model is illustrated in **Figure 1**, with the exclusion of the loadings on the two factors for the purpose of enhancing clarity. The changes in the pandemic G-AS scores were strongly predicted (66.1%) by eleven variables, and eight of these variables were also associated with adverse childhood experiences. Consequently, adverse childhood experiences had highly significant total indirect effects ($t = 32.55$, $p < 0.0001$) on the variations in pandemic G-AS, resulting in a substantial total impact of adverse childhood experiences ($t = 35.62$, $p < 0.0001$). In fact, of all total effects computed, adverse childhood experiences showed the strongest total effect after baseline G-AS scores ($t=99.78$, $p<0.001$), and is followed by feeling isolated ($t=17.09$, $p<0.001$), physical pain ($t=14.06$, $p<0.001$), negative life events ($t=13.64$, $p<0.001$), family interactions ($t=12.46$, $p<0.001$), and mental disorders ($t=7.71$, $p<0.001$).

A sensitivity PLS analysis was conducted on the stratified probability (representative) sample collected during the fourth wave. According to ESF3, Figure 7, the PLS model obtained in the representative sample is shown to be equivalent to the PLS model derived in the complete sample, which includes data from all four waves. The findings from the fourth wave sample indicate that adverse childhood experiences had a statistically significant and substantial impact on the pandemic G-AS score, as evidenced by the total indirect effects ($t = 10.43$, $p < 0.0001$).