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RESEARCH ARTICLE

Cross-Cultural Differences in Psychological Health, Perceived Stress, and Coping Strategies of University Students During the COVID-19 Pandemic

Noor Hassline MOHAMED [1], Amoneeta BECKSTEIN [2] ✉, Paul B. HUTCHINGS [3], Nicholas Tze Ping PANG [4], Shariffah Rahah Sheik DAWOOD [5], Risydah FADILAH [6], Katie SULLIVAN [7], Azizi YAHAYA [8], and Jay Errol Villadolid BARAL [9]

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[1] Faculty of Psychology and Education, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia
[2] Psychology Department, Fort Lewis College, Durango, CO, USA
[3] Centre for Psychology and Counselling, University of Wales Trinity Saint David, Wales, United Kingdom
[4] Faculty of Medical and Health Science, Universiti Malaysia Sabah, Kota Kinabalu, Sabah Malaysia
[5] Department of Psychology, The Behrend College, Penn State University, Pennsylvania, USA
[6] Faculty of Psychology, Universitas Medan Area Indonesia, Medan, Indonesia
[7] Centre for Psychology and Counselling, University of Wales Trinity Saint David, Wales, United Kingdom
[8] Faculty of Psychology and Education, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia
[9] Wesleyan University-Philippines, Cabanatuan City, Nueva Ecija, Philippines

✉ Correspondence
Amoneeta Beckstein
Psychology Department, Fort Lewis College
Postal Address: 1000 Rim Drive, Durango, CO 81301 USA
Email: amoneeta@asu.edu

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Introduction: COVID-19 has affected the entire world, including university students. Students are likely to experience COVID-19 related stress that might adversely affect their psychological health and result in various coping strategies.
Aims: This study's objectives were to examine cross-cultural differences and the relationships between stress, psychological health, and coping among university students during the pandemic. Furthermore, the study explored whether coping strategies mediated the relationship between psychological health and perceived distress for this population.
Methods: University students (n = 703) were recruited via convenience sampling from Indonesia, Malaysia, the Philippines, Thailand, the United States, and the United Kingdom. Participants completed an online quantitative questionnaire consisting of demographics, the Perceived Stress Scale, the General Health Questionnaire, and the Brief-COPE.
Results: Perceived psychological distress was significantly associated with poorer general psychological health and both were associated with dysfunctional coping. For all countries, psychological health mediated the relationship between perceived distress and dysfunctional coping. Students from individualistic cultures reported higher stress and poorer psychological health when compared to those from collectivistic countries. The latter tended to engage in more emotion-focused and problem-focused coping and used more dysfunctional coping strategies than the former.
Conclusions: Future research should explore other mediators and moderators that affect university students' responses to pandemics and should include longitudinal studies with larger samples. Findings emphasize the need for providing university students with mental health support during and after COVID-19. It is important to develop and research empirically based strategies for reducing their stress and psychological distress through effective and culturally appropriate coping strategies.

Keywords: coping, cross-cultural, COVID-19, psychological health, university students

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Introduction

As the world learns to cope with the changes brought on by the COVID-19 pandemic, it is likely that some people will experience significant pandemic-related psychological distress (see Inauen & Zhou, 2020, and Robinson et al., 2022 for reviews). Universities and university students around the world have experienced major impacts of the COVID-19 pandemic (Sahu, 2020). Many universities closed their campuses (Foresman, 2020), canceled in-person teaching and activities and started distant learning (Sahu, 2020). They creatively continued classes via various methods and technologies online (Calonge et al., 2021); however, not all universities and professors were prepared, and some students may not have possessed adequate facilities such as computers and internet (Sahu, 2020). Being unable to interact well with professors and peers may have a negative effect on grades (Sahu, 2020) which could, in turn, contribute to psychological distress. Whilst research on the current pandemic is limited at this point in time, initial studies appear to suggest that it can cause significant psychological distress among university students (John, 2020; Liu et al., 2020) and young adults (Qiu et al., 2020) including anxiety, depression, and stress associated with the uncertainties and frustrations related to COVID-19. During a previous outbreak of Severe Acute Respiratory Syndrome (SARS), many university students experienced elevated psychological distress (Main et al., 2011). Therefore, exploring how the COVID-19 pandemic is affecting this population's psychological health and coping appears to be necessary.

The unusual circumstances brought on by the pandemic might directly affect students. Some may have had to return to their hometowns; some may have been locked down on their campuses or in university halls due to the sudden nature of governmental lockdowns. Students may rely on their universities for pertinent information and support during these uncertain times (Calonge et al., 2021). However, universities have not always been consistent in communicating expectations (Zhou, 2020) possibly contributing to additional stress.

Many university students were already prone to stress that affects their coping abilities and psychological well-being (Böke et al., 2019; Fasoro et al., 2019; Ganesan et al., 2018; Ribeiro et al., 2018). With the potential mental health consequences of COVID-19 likely to be high for university students, it becomes important to explore stress, psychological health, and coping among this population. Yet, to date, no empirical study has been conducted looking at stress, psychological health, and coping skills among university students. Eighteen to thirty-year-olds, the age group most college students belong to, are among the vulnerable groups that Qiu et al. (2020) recommend further investigating in terms of COVID-19 psychological distress. This study contributes to filling that gap by exploring the above factors. It is hoped that the study will produce a knowledge base and offer ideas on how mental health professionals might help reduce and prevent the longer-term more severe effects by treating university students during the peritraumatic phase of the COVID-19 pandemic, as primary prevention public health interventions are paramount during the critical phase of any pandemic (Mukhsam et al., 2020). Furthermore, since SARS survivors have experienced or even continue to experience significant psychological distress (Gardner & Moallef, 2015), the study might help mitigate the possible negative mental health consequences for university students who have experienced the COVID-19 pandemic.

The high prevalence of psychological distress possibly related to the effects of the COVID-19 pandemic is a global concern as it may impair psychological and mental-health wellbeing. Because there are many intersecting risks and protective factors that either protect an individual or make them more vulnerable to developing psychological disorders during stressful times (Masten & Garmezy, 1985), some individuals will have a greater chance of suffering distress during the pandemic than others. Social isolation, anxiety, fear of contagion, uncertainty, chronic stress and economic difficulties may lead to the development or exacerbation of depression, anxiety, substance use and other psychiatric disorders in vulnerable populations including individuals with pre-existing psychiatric disorders and people who reside in high COVID-19 prevalence areas (Sher, 2020). A study conducted by Patsali et al. (2020) that investigated mental health among university students in Greece indicated that during lockdown, major depression was present in 12.43% of their sample with 13.46% experiencing severe distress. These findings indicate that university students may be vulnerable to possible adverse mental health consequences in relation to the COVID-19 outbreak. At the time of this study, the research on university students' well-being during the pandemic was limited in many countries, or not available. Hence, it seems important to assess university students' psychological well-being during this pandemic.

The central idea for the current study's authors was therefore to survey the psychological health of a cross-section sample of university students' studying in the following countries: Malaysia; the Philippines; Thailand; Indonesia; the United Kingdom; and the United States of America, during the pandemic. The main objective was to examine cross-cultural differences in psychological health, perceived distress, and coping during the COVID-19 pandemic in university student populations. It was hypothesized that cross-cultural differences would exist between university students from stereotypically collectivistic countries and students from stereotypically individualistic countries (Hofstede, 2001; Triandis, 1995) in terms of their psychological health, perceived distress, and coping styles in reaction to the COVID-19 pandemic. People from individualistic societies tend to be more focused on individual

goals and well-being; this is in contrast with those from collectivistic societies, who tend to be more focused on the goals and well-being of their group (Triandis, 1995). The former emphasizes independence while the latter emphasizes interdependence. The second objective was to determine the relationship between perceived distress, psychological health and coping strategies among university students. It was predicted that both perceived distress and maladaptive coping would be negatively related to psychological health while adaptive coping would be positively related. The third objective was to examine whether adaptive and dysfunctional coping strategies mediate the relationship between perceived distress and psychological health among university students. It was hypothesized that the type of coping strategy would mediate the relationship between psychological health and perceived distress.

Methods

The study employed a cross sectional method by using multiple mediational models. The sample population consisted of university students studying in six countries: Malaysia, the Philippines, Thailand, Indonesia, the United Kingdom, and the United States of America. The inclusion criteria required the participants to be undergraduate university students who were 18 years old and above and were able to give consent. The survey link was sent out in April 2020 to students at various universities by their professors who offered a small amount of extra credit for voluntary participation. Data was collected from April 6, 2020 (1st survey collected) to April 24, 2020 (the last survey collected in the current sample). There was no penalty for non-participation. There were no formal exclusion criteria except for non-consent or the inability to answer the questionnaires. The sampling method was convenience sampling from all six countries concerned. Randomization of sampling was difficult to perform as students in most universities were under varying forms of national Movement Control Orders, hence the researchers had to rely on students volunteering themselves. The sampling frame was all undergraduate students in all six countries.

Instruments

Demographic Questionnaire

Information on students' demographic characteristics consisting of questions regarding age, gender, citizenship, education, employment status, internet accessibility, and satisfaction with online learning, was obtained. Three psychological instruments were completed (PSS-10, GHQ-12, and Brief COPE-28) via Google Forms.

Perceived Stress Scale (PSS-10)

A widely used measure for assessing stress is the Perceived Stress Scale, which consists of 10 questions that measure feelings and thoughts in the past month associated with life events and out of control events (e.g., "In the last month, how often have you felt nervous and 'stressed'?"). The scale is a 5-point Likert-type scale (1 = Never; 5 = Often) with higher scores indicating greater perceived levels of stress (Sandhu et al., 2015). Statistically, its internal reliability is reasonable, with a Cronbach's alpha >.70 in 12 separate studies and the test-retest reliability of the PSS-10 was found to be >.70 in four studies (Lee, 2012).

General Health Questionnaire (GHQ-12)

The 12-item version of the General Health Questionnaire (GHQ) measures psychological health (e.g., "Please indicate how often you have been able to concentrate on what you are doing") (reverse coded). The questions are on a 4-point Likert-type scale (1 = Less than usual; 4 = Much more than usual). Despite originally being devised in Britain (Goldberg et al., 1997), it has been shown to be effective cross-culturally, especially in the vital domains of depressive and anxiety symptoms (Abubakar & Fischer, 2012; Araya et al., 1992; Padrón et al., 2012; Patel et al., 2008). It is categorized into three separate factors: Anxiety and Depression, Social Dysfunction, and Loss of Confidence. The maximum score is 36, with higher scores directly correlating to worse psychological outcomes.

Brief COPE (Brief COPE-28)

The Brief COPE is a 28-item self-report questionnaire that measures multiple coping strategies for adapting and reacting to life events (e.g., "I've been turning to work or other activities to take my mind off things"). The questions

are on a 4-point Likert-type scale (1 = I haven't been doing this at all; 4 = I've been doing this a lot). This scale assesses the frequency of 28 different coping strategies (Carver, 1997). The scale contains the following separate two-item subscales: (1) self-distraction, (2) active coping, (3) denial, (4) substance use, (5) use of emotional support, (6) use of instrumental support, (7) behavioral disengagement, (8) venting, (9) positive reframing, (10) planning, (11) humor, (12) acceptance, (13) religion, and (14) self-blame. These 14 subscales are further categorized into three overarching coping styles: dysfunctional (avoidant), problem-oriented, and emotion-oriented coping (Dias et al., 2012).

Data Analysis

IBM SPSS was used for all data analyses. Data were analyzed descriptively and measures of skewness and kurtosis were employed to determine whether data fulfilled normality assumptions. Cronbach's alpha was calculated on all study scales to ensure internal consistency. Multiple regressions were performed to examine whether stress responses were predicted by coping styles and general psychological health subscales. Pearson correlations were used to establish correlations between continuous variables. *T*-tests were used to determine whether any significant difference existed for bivariate independent variables. A series of multiple regressions were performed, using the Baron and Kenny method, to assess if dysfunctional coping styles were mediators of the relationship between perceived stress and psychopathology. Sobel's test was performed to assess whether the mediation relationship was statistically significant. Multivariate Analysis of Variance (MANOVA) was performed to assess if there were any significant differences between collectivistic and individualistic countries for scores of perceived stress, psychological distress, and coping styles. The Bonferroni correction was performed as appropriate.

Results

Data was gathered from 703 participants and screened for outliers using a repeated measures design, dependents together with boxplot method. Eighteen participants were identified as having given responses outside of acceptable limits, so data from these participants were removed from the dataset. Of the remaining 685 participants (Malaysia = 98; Thailand = 25; Indonesia = 209; Philippines = 92; United Kingdom = 67; United States of America = 86; Other/No country indicated = 108) 488 (71.2%) identified as female and 194 (28.3%) as male, with three participants not specifying a gender. Reliability analyses were run on the three scales used in the study; the 10-item PSS (Cronbach's α = .80), the 12-item GHQ (subscales of 6-item Social Dysfunction α = .84; 4-item Anxiety and Depression α = .73; the 2-item Loss of Confidence α = .78), and the 28-item Brief COPE (subscales of 10-item Emotion-focused α = .81; 6-item Problem-focused α = .78; and 12-item Dysfunctional strategies α = .80). Therefore, all measures were considered to provide robust levels of reliability within the study.

Multiple Regression Analysis

To examine whether scores on the GHQ and Brief COPE could predict participant responses on the PSS, a multiple regression analysis was carried out using the subscales as predictor variables. This analysis included data from 366 participants who completed all measures of the survey. Descriptive statistics for the subscales (Table 1) and correlations between measures (Table 2) are presented below, alongside collinearity test results (Table 3).

Table 1. Subscale Mean Total Scores for Questionnaire Measures

Measure	Mean Score *(SD)*
PSS	3.14 (.61)
GHQ Social Dysfunction	2.79 (.67)
GHQ Anxiety and Depression	2.45 (.66)
GHQ Loss of Confidence	2.31 (.84)
Brief COPE Emotion-focused	2.57 (.60)
Brief COPE Problem-focused	2.63 (.64)
Brief COPE Dysfunctional Strategies	1.88 (.43)

Note: Standard deviations in parentheses.

Table 2. Correlations Between Subscale Measures

	1	2	3	4	5	6	7
1. PSS	–						
2. GHQ SD	.46**	–					
3. GHQ AD	.60**	.30**	–				
4. GHQ LC	.59**	.35**	.65**	–			
5. BC EF	–.10*	–.45**	–.05	–.04	–		
6. BC PF	–.09*	–.47**	–.03	–.06	.75**	–	
7. BC DS	.31**	–.09*	.30**	.38**	.50**	.46**	–

** Significant at .001 level.
* Significant at .05 level.

Table 3. Tests of Collinearity for Subscale Measures

Measure	Collinearity Tolerance
GHQ Social Dysfunction	.64
GHQ Anxiety and Depression	.56
GHQ Loss of Confidence	.49
Brief COPE Emotion-focused	.39
Brief COPE Problem-focused	.40
Brief COPE Dysfunctional Strategies	.57

Table 4. Regression Coefficients for Questionnaire Subscale Measures

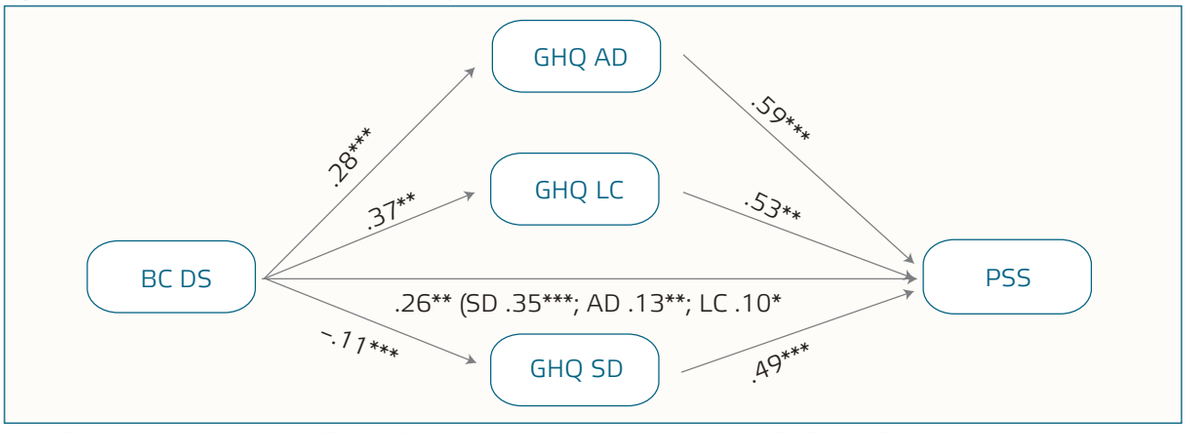
Variable	*B*	SE *B*	β	*p*
GHQ SD	.48	.07	.31	< .001
GHQ AD	.81	.12	.35	< .001
GHQ LC	.55	.20	.15	.006
BC EF	–.07	.06	–.06	.29
BC PF	.06	.10	.04	.54
BC DS	.20	.05	.19	< .001

As each predictor appears to not correlate highly with other predictors, these were entered into a multiple regression using the standard method. A significant model emerged: $F(6,359) = 58.97$, $p < .001$. The model explains 49% of the variance in perceived stress (adjusted R^2 =.49). Table 4 provides regression coefficient data for the predictor variables entered in the model. The three subscales of the GHQ (SD; AD; and LC) emerge as significant predictors of PSS, whilst only the Dysfunctional Strategy subscale of the Brief COPE appears as a significant predictor. To examine the relationship between scores on the GHQ subscales and the Brief COPE Dysfunctional Strategy subscale (as the only subscale to emerge as a significant predictor from that scale; see Table 4) and their prediction of scores on the PSS, a mediation analysis was carried out, first on the overall model and then individually by culture type (individualistic or collectivistic).

Mediation Analysis: Overall

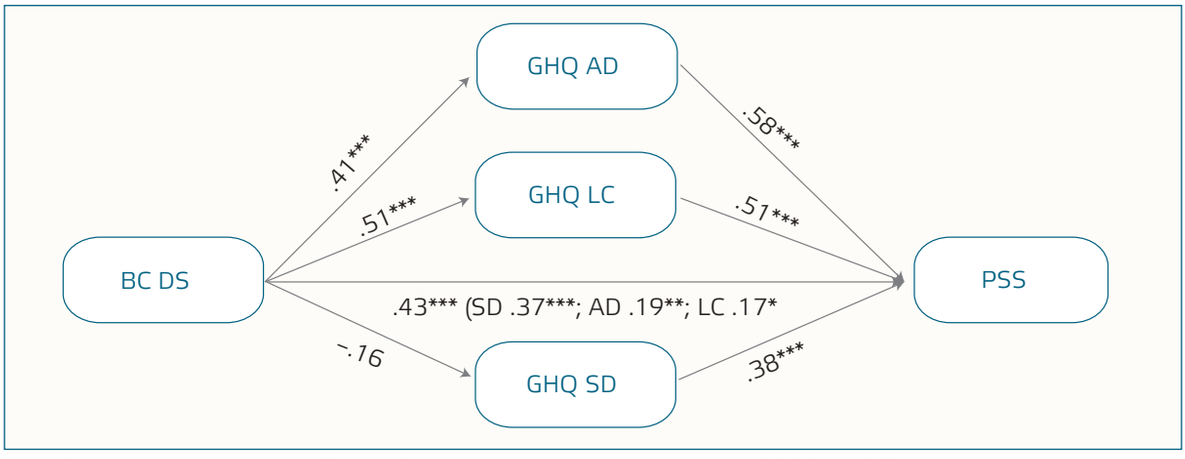
As the demographic information (age, gender, citizenship, education, employment status, internet accessibility, and satisfaction with online learning) contained a number of missing responses, it was decided to focus the mediation analysis upon those that had completed the core instruments of the study. The relationship between scores on the Brief COPE Dysfunctional Strategy (BC DS) subscale and Perceived Stress Scale (PSS) was mediated by scores on the General Health Questionnaire Social Dysfunction (GHQ SD), Anxiety and Depression (GHQ AD) and Loss of Confidence (GHQ LC) subscales. The standardized regression coefficient between BC DS scores and GHQ SD scores was statistically significant, as was the standardized coefficient between GHQ SD scores and PSS scores. The standardized indirect effect was (–.11) (.49) = –.05, with a Sobel test of the mediation effect found to be significant (–2.78, $p < .01$). The standardized regression coefficient between BC DS scores and GHQ AD scores was statistically significant, as was the standardized coefficient between GHQ AD scores and PSS scores. The standardized indirect effect was (.28) (.59) = .17, with a Sobel test of the mediation effect found to be significant (5.13, $p < .001$). The standardized regression coefficient between BC DS scores and GHQ LC scores was statistically significant, as was the standardized coefficient between GHQ LC scores and PSS scores. The standardized indirect effect was (.37) (.53) = .2, with a Sobel test of the mediation effect found to be significant (2.94, $p < .001$). Figure 1 displays the overall model.

Figure 1. Overall mediation of BC DS by GHQ measures on PSS



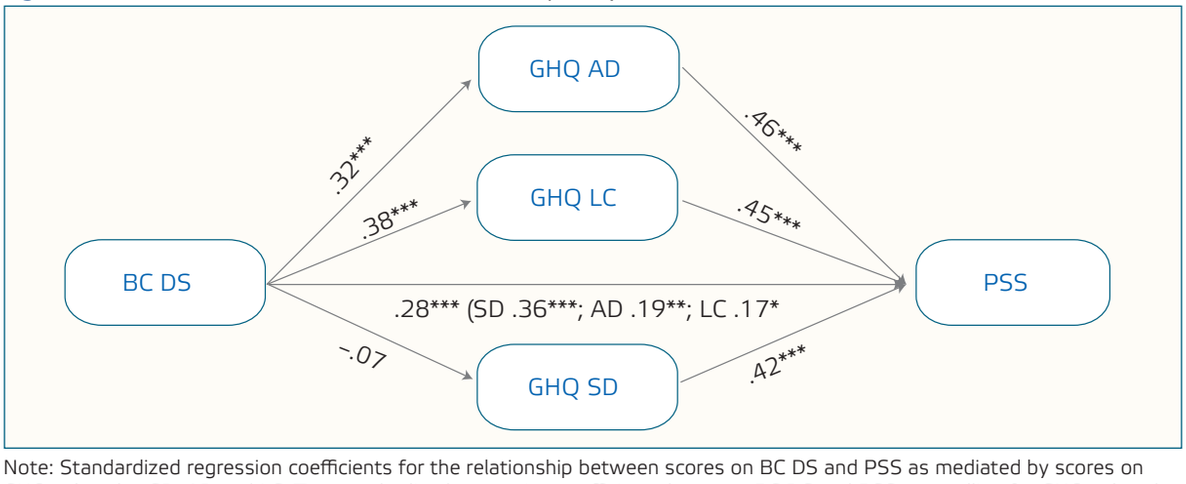
Note: Standardized regression coefficients for the relationship between scores on BC DS and PSS as mediated by scores on GHQ subscales SD, AD and LC. The standardized regression coefficients between BC DC and PSS, controlling for GHQ subscale scores, are in parentheses.
*<.05 **<.01 ***<.001.

Figure 2. Individualisctic culture mediation of BC DS by GHQ measures on PSS



Note: Standardized regression coefficients for the relationship between scores on BC DS and PSS as mediated by scores on GHQ subscales SD, AD and LC. The standardized regression coefficients between BC DC and PSS, controlling for GHQ subscale scores, are in parentheses.
*<.05 **<.01 ***<.001.

Figure 3. Collectivictic culture mediation of BC DS by GHQ measures on PSS



Note: Standardized regression coefficients for the relationship between scores on BC DS and PSS as mediated by scores on GHQ subscales SD, AD and LC. The standardized regression coefficients between BC DC and PSS, controlling for GHQ subscale scores, are in parentheses.
*<.05 **<.01 ***<.001.

Mediation Analysis: Cultural Differences

To examine whether individualistic and collectivistic countries differed in their responses, mediation analysis explored the relationship between scores on the Brief COPE Dysfunctional Strategy (BC DS) subscale and Perceived Stress Scale (PSS) for participants from the UK and USA (Individualistic; n = 153) and Malaysia, Thailand, Indonesia and the Philippines (Collectivistic; n = 180) were mediated by scores on the General Health Questionnaire Social Dysfunction (GHQ SD), Anxiety and Depression (GHQ AD) and Loss of Confidence (GHQ LC) subscales. Statistical analyses for indirect effects and mediation effects for each culture type are indicated below. Figure 2 displays the individualistic model and Figure 3 displays the collectivistic model.

For individualistic cultures, the standardized regression coefficient between BC DS scores and GHQ SD scores was not statistically significant, whilst the standardized coefficient between GHQ SD scores and PSS scores was significant. The standardized indirect effect was (.16) (.38) = .06, with a Sobel test of the mediation effect found to be significant (4.08, p < .001). The standardized regression coefficient between BC DS scores and GHQ AD scores was statistically significant, as was the standardized coefficient between GHQ AD scores and PSS scores. The standardized indirect effect was (.41) (.58) = .24, with a Sobel test of the mediation effect found

to be significant (3.67, $p < .001$). The standardized regression coefficient between BC DS scores and GHQ LC scores was statistically significant, as was the standardized coefficient between GHQ LC scores and PSS scores. The standardized indirect effect was (.51) = .26, with a Sobel test of the mediation effect found to be significant (3.56, $p < .001$).

For collectivistic cultures, the standardized regression coefficient between BC DS scores and GHQ SD scores was not statistically significant, whilst the standardized coefficient between GHQ SD scores and PSS scores was significant. The standardized indirect effect was (-.07) (.42) = -.03, with a Sobel test of the mediation effect found to be nonsignificant (-0.77, *ns*). The standardized regression coefficient between BC DS scores and GHQ AD scores was statistically significant, as was the standardized coefficient between GHQ AD scores and PSS scores. The standardized indirect effect was (.32) (.46) = .15, with a Sobel test of the mediation effect found to be significant (3.23, $p < .001$). The standardized regression coefficient between BC DS scores and GHQ LC scores was statistically significant, as was the standardized coefficient between GHQ LC scores and PSS scores. The standardized indirect effect was (.38) (.45) = .17, with a Sobel test of the mediation effect found to be nonsignificant (0.97, *ns*).

Cross-Cultural Comparisons

To examine whether differences in student PSS, GHQ, and Brief COPE scores exist between individualistic and collectivistic cultures, a Multivariate Analysis of Variance was performed on the subscale scores. Mean scores for each dependent variable were used as opposed to total scores to allow for a direct comparison across Subscales. Levene's Test for subscales showed breaches for the SD and LC subscales of the GHQ across cultures, so these were removed from the subsequent analysis, and moderate correlations were found among the dependent variables. A significant difference existed between cultures on the combined measures, $F(5,327) = 23.04$, $p < .001$; Wilks' Lambda = .74. The analysis of each individual dependent variable, using a Bonferroni adjusted alpha level of .01, showed that there were significant differences among countries on *GHQ AD*, $F(1,331) = 15.12$, $p < .001$; *BC EF*, $F(1,331) = 69.08$, $p < .001$; *BC PF*, $F(1,331) = 68.64$, $p < .001$; *BC DS*, $F(1,331) = 26.34$, $p<.001$; and *PSS*, $F(1,331) = 17.96$, $p < .001$. Mean scores for each of the MANOVA measures are provided in Table 5.

Finally, independent samples *t*-tests were calculated for each of the measures (*PSS*, *GHQ subscales* and *BC subscales*) and the results are presented in Table 6. Apart from *GHQ LF*, which differed at a significant difference level of $p = .005$, all results showed significant differences $p < .001$.

Table 5. Mean Scores on Questionnaire Items by Country for Questionnaire Subscales

Measure	Country	Mean *(SD)*	*N*
GHQ AD	Individualistic Collectivistic	2.60 (.64) 2.32 (.66)	153 180
BC EF	Individualistic Collectivistic	2.84 (.50) 2.32 (.59)	153 180
BC PF	Individualistic Collectivistic	2.92 (.60) 2.36 (.61)	153 180
BC DS	Individualistic Collectivistic	1.77 (.39) 1.98 (.44)	153 180
PSS	Individualistic Collectivistic	3.29 (.66) 3.01 (.52)	153 180

Note: Due to each questionnaire and subscale having different numbers of items the mean item score is preferred here to the total score as this allows for a direct comparison across subscales, since each item is scored on a four-point scale.

Table 6. Individualistic Versus Collectivistic Culture Scores on Measure Subscales

Measure	Individualistic Mean *(SD)*	Collectivistic Mean *(SD)*	Independent samples *t*-test statistic
PSS	3.29 (.66)	3.01 (.52)	$t(224) = 4.58$, $p < .001$*
GHQ SD	3.12 (.54)	2.50 (.63)	$t(331) = 9.47$, $p < .001$
GHQ AD	2.60 (.64)	2.32 (.66)	$t(331) = 3.89$, $p < .001$
GHQ LC	2.45 (.83)	2.19 (.84)	$t(331) = 2.83$, $p = .005$
BC EF	2.84 (.50)	2.32 (.60)	$t(317) = 10.31$, $p < .001$*
BC PF	2.92 (.60)	2.36 (.61)	$t(569) = 9.66$, $p < .001$
BC DS	1.77 (.39)	1.98 (.44)	$t(566) = -5.06$, $p < .001$

* Levene's Test breached so alternate df and t statistic provided.

Discussion

Multiple key findings result from this study. There was some indication that the college student sample from the current study may have been experiencing somewhat elevated distress compared to pre-pandemic samples. While scores on the GHQ measures for the current study are similar to a previous sample (e.g., Patel et al., 2008), the mean scores for the Brief COPE and PSS in the current study are higher than has been reported in previous studies on university students (e.g., Poulus et al., 2020; Roberti et al., 2006 respectively); however, this may not be surprising given the context of the situation that participants found themselves in during the pandemic.

Firstly, perceived psychological distress during the COVID-19 pandemic was shown to positively correlate with higher levels of disturbance in college students' general psychological health, which stands consistent with previous literature (Demakis & McAdams, 1994; The American College Health Association, 2007). As expected, significant negative correlations emerged between both the perceived stress and the social dysfunction (GHQ-SD) subscale with problem- and emotion-focused coping strategies. These results may be in line with the pre-pandemic context: nursing students who took the GHQ and Brief COPE were also found to exhibit a positive association between dysfunctional coping and psychological distress, with health habits mediating that relationship (Tada, 2017). Perceived stress and unstable psychological health were also positively correlated with the use of dysfunctional coping strategies. This corroborates existing interrelations between dysfunctional coping behavior and poorer psychological health (Holahan et al., 2005; Mahmoud et al., 2012; Main et al., 2011; Meyer, 2001; Mohr et al., 2014; Penley et al., 2002).

Secondly, poor psychological health and coping strategies explained almost half (49%) of the variance in perceived stress in this current study. Three psychological health factors (social dysfunction, anxiety and depression, and loss of confidence) and specifically "dysfunctional" coping strategies were statistically significant ($p = < .05$) in explaining the variance. Such psychological health factors are part of overarching theoretical models explaining students' perceived stress. Social isolation due to prolonged mass quarantine or lockdown thus appears to escalate anxiety and loss of control (Rubin & Wessely, 2020; Usher et al., 2020) particularly among college students (Wang et al., 2020). The evidence is unanimous that avoidant coping approaches increase psychological distress and thus, teaching coping skills could decrease psychopathology (Böke et al., 2019; Ghalechi & Movahhed, 2013; Pang, Shoesmith et al., 2020). Teaching coping skills in the unique context of a global and uncontrollable pandemic, however, presents equally unique difficulties (Salvaraji et al., 2020).

Thirdly, the relationship between dysfunctional coping strategies and perceived distress was mediated by all subscales of psychological health *(GHQ-12)*. While this relationship may have been exacerbated by the pandemic, it is also likely that such a relationship already existed pre-pandemic. In fact, active coping previously has been found to positively relate to psychological health (Tada, 2017). The relationship between dysfunctional coping and perceived stress mediated by psychological health remained the case when the six countries were divided into collectivistic and individualistic cultures, with the level of both perceived stress and psychological health found to be higher among students from individualistic cultures or countries than in collectivistic cultures (see also Delfino et al., 2015; Zhao & Zhang, 2018).

These findings regarding individualistic versus collectivistic countries merit further discussion. Participants from collectivistic countries in this study successfully used more emotion- and problem-focused coping, but also used more dysfunctional coping strategies. This tallies with limited and sometimes contradicting empirical studies related to culture and coping in the present literature (Kuo, 2011; Lee & Mason, 2014; Main et al., 2011). The latter finding is easily explained as dysfunctional coping is more prevalent when collectivist cultures "control or suppress their emotions and behaviors, often changing themselves in order to fit into the group rather than confront and modify the external stressors (Hofstede, 2001; Shulruf et al., 2007)" (as cited in Lee & Mason, 2014, p. 442). The former finding that collectivistic cultures better use problem and emotion-focused coping, however, yields mixed support from the literature (Bjorck et al., 2001; Cole et al., 2002), which may be indicative of a Hawthorne effect (McCambridge et al., 2014). Collectivist countries value collective and community wellbeing, place much less value on personal choice, value adaptation to others, even with significant self-sacrifice (Hofstede, 2001; Kuo, 2011; Shulruf et al., 2007), and have higher levels of groupthink (Koh et al., 2020). Hence, college students in individualistic countries may perceive more stress and suffer from negative psychological health compared to students from more collectivistic cultures, because they may perceive an extreme lack of control, as they may have been given limited choice in the decision-making process during lockdowns imposed amid the COVID-19 pandemic. On the other hand, students from more collectivistic countries may be less resistant and adhere to rules set by their governments so as to ensure their communities' wellbeing. Collectivist cultures may also "deny, sup-

press, or repress the experience and expression" (Hwang et al., 2008, p. 215) of open displays of emotional distress because of the "strong stigma associated with mental illness (Chun et al., 1996)" (as cited in Hwang et al., 2008, p. 215) and because "displays of psychological symptoms are perceived as characteristic of personal or emotional weakness" (Hwang et al., 2008, p. 215), resulting in lower levels of perceived psychopathology.

Strengths and Limitations

This study had a number of strengths. Considering how quickly and unexpectedly the pandemic manifested, the first strength was the pre-established relationships between the researchers based in different countries allowing them to be able to conceptualize and organize the study and quickly collect data at a time when much of the world roiled in chaos. Next, the researchers were able to collect data from six different countries allowing for cross-cultural comparisons that are often lacking in psychological research. Furthermore, while the sample remained small, it was large enough to have sufficient statistical power to show significant results, even when comparing across groups. Lastly, the study used pre-established quantitative measures that have respectable psychometric properties.

This study naturally had limitations. First, it is just a cross-sectional study that only recruited participants from the beginning of the pandemic. Next, the study looked at a limited number of participants. These participants were further divided into collectivist and individualistic countries, thereby making the comparison groups relatively small. Furthermore, while students were currently studying in a stereotypically collectivistic or individualistic country, we did not measure their level of this variable. Indeed, it seems likely that some participants studying in an individualistic country may be more collectivistic and vice versa (Parker et al., 2009).

Conclusion, Implications and Future Directions

In conclusion, the take-home messages of this study are as follows: Among university students, social dysfunction, anxiety and depression, and loss of confidence are key mediators of the relationship between dysfunctional coping and perceived distress, while cross-cultural variations exist in these psychological process variables. Hence, this study serves as a clarion call to university administrators – and certainly mental health practitioners – to design easily accessible, high quality, evidence-based interventions that are multiculturally appropriate to the context in order to help reduce university students' psychological distress during and after the COVID-19 pandemic.

This elucidation of theoretical mechanisms translates into crucial clinical lessons and may have relevant implications for university students' mental wellbeing. University students clearly require additional, timely, crisis-oriented mental health services and monitoring, which extant literature echoes (Liu et al, 2020; Horesh & Brown, 2020; Qiu et al., 2020). Moreover, reducing dysfunctional coping strategies during pandemics is essential as it can reduce depressive symptoms (Pang, Masiran, et al., 2020). Of course, all of the above are likely to be relevant for university students before, after, and despite the pandemic. If we perform interventions to tackle our established mediators, namely social dysfunction and loss of confidence, it will likely significantly dampen the effect of pre-existing dysfunctional coping styles on stress levels. Such interventions have already been developed specifically in ultra-brief format, adapted for COVID-19 specific stress, and appear helpful to frontline hospital workers (Pang, Shoesmith, et al., 2020). As cultural perceptions of stress and mental health issues converge, it is hence imperative that governments, universities, and healthcare sectors act quickly to prevent this potential "second pandemic" involving mental health issues. University students coincidentally fall into the age group in which the prevalence of depressive and anxiety disorders stands highest (Böke et al., 2019; Ribeiro et al., 2018); hence, developing timely and continuous online screening tools and COVID-19 related psychological instruments (Pang, Kamu, et al., 2020) to identify "students with insufficient coping skills under chronic stress and at risk for mental health problems" needs to be prioritized (Delfino et al., 2015; Mohr et al., 2014, p. 235). In addition, cultural differences need to be considered, as they can affect illness behavior and have subtle effects on when, how, and how late people report to mental health services (Main et al., 2011; Pang, Shoesmith et al., 2020). Hence, since universities tend to be multicultural with students from many different cultures, such young people may have varied distress and coping responses to pandemics. Interventions may need, therefore, to be designed to adapt to the specific needs of students from different cultures and studying in different places.

Based on this study, there are a number of directions that future researchers can consider. While collecting data at the beginning of the pandemic was an important moment to understand the pandemic's effects, follow-up and

longitudinal studies might help further understand how university students might be coping with the pandemic, or not. It is further recommended that future researchers replicate this study with much greater sample sizes, more countries, and many different cultures. Future researchers could measure the participants' level of collectivism/individualism in order to be more certain that the results are indeed related to this cultural variable rather than another variable.

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Author contributions
Noor Hassline MOHAMED: conceptualization, design, methodology, investigation, project administration, writing original draft.
Amoneeta BECKSTEIN: conceptualization, design, investigation, writing original draft, writing review and editing.
Paul B. HUTCHINGS: conceptualization, design, investigation, data management, formal analysis, interpretation, writing original draft, writing review and editing.
Nicholas Tze Ping PANG: conceptualization, design, investigation, writing original draft, writing review and editing.
Shariffah Rahah Sheik DAWOOD: conceptualization, design, investigation, writing original draft.
Risydah FADILAH: conceptualization, design, investigation, writing original draft.
Katie SULLIVAN: data management, formal analysis, interpretation, writing original draft.
Azizi YAHAYA: investigation, writing original draft.
Jay Errol Villadolid BARAL: investigation, writing original draft.
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Ethical statement
This manuscript is the authors' original work.
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ORCID
Noor Hassline MOHAMED https://orcid.org/0000-0002-7956-7637
Amoneeta BECKSTEIN https://orcid.org/0000-0002-3702-0991
Paul B. HUTCHINGS https://orcid.org/0000-0003-1480-6454
Nicholas Tze Ping PANG https://orcid.org/0000-0003-1659-6374
Shariffah Rahah Sheik DAWOOD https://orcid.org/0000-0002-8299-6168
Risydah FADILAH https://orcid.org/0000-0002-4298-0196
Katie SULLIVAN https://orcid.org/0000-0002-9489-6316
Azizi YAHAYA https://orcid.org/0000-0002-9847-7901
Jay Errol Villadolid BARAL https://orcid.org/0000-0002-5972-6928

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