

Title: Cross-cultural Differences in Psychological Health During Covid-19

Authors: Mohamed, N. H., Beckstein, A., Hutchings, P. B., Pang Tze Ping, N., Dawood, S., Sullivan, K. E., Fadilah, R., Yahaya, A., & Villadolid, J.

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ABSTRACT

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 use of various coping strategies. 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. University students ($n=703$) were recruited via convenience sampling from Indonesia, Malaysia, Philippines, Thailand, the United States, and the United Kingdom. Participants completed an online quantitative questionnaire consisting of general demographics, the Perceived Stress Scale, the General Health Questionnaire, and the Brief-COPE. Perceived psychological distress was significantly associated with poorer general psychological health and both were associated with dysfunctional coping. Among all countries involved, 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. Future research should explore other mediators and moderators that affect university students' responses to pandemics and should include longitudinal studies with larger samples. Findings emphasise the need for providing university students mental health support during and after COVID-19. Moreover, 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; stress; university students

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

1. 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 from the COVID-19 pandemic (Sahu, 2020). Many universities closed their campuses (Foresman, 2020) and cancelled in-person teaching and activities and started distant learning (Sahu). They creatively continued classes via various methods and technologies online (Linney, 2020); however, not all universities and professors were prepared, and some students may not possess 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 needed.

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 “as a source of information, direction, and reassurance” (Linney, 2020) during these uncertain times. 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 30-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 this gap by exploring these 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 & Moallem, 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 risk and protective factors that

either protect an individual or make them more vulnerable to the development of 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 depressive, 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 or not available for many countries. Hence, it seems important to assess university student psychological well-being during this pandemic.

The central idea of the current study was therefore to survey the psychological health of a cross section sample of university students' studying in the following countries: Malaysia; Philippines; Thailand; Indonesia; 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 hypothesised that there would be cross-cultural differences 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 wellbeing; this is contrasted with those from collectivistic societies who tend to be more focused on the goals and wellbeing of their group (Triandis, 1995). The former emphasises independence while the latter emphasises 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 hypothesised that the type of coping strategy would mediate the relationship between psychological health and perceived distress.

2. Materials and Methods

The study employed a cross sectional method by using multiple mediational models. The sample population was university students studying in six countries: Malaysia, Philippines, Thailand, Indonesia, the United Kingdom, and the United States of America. The inclusion criteria were all 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 6th, 2020 (1st survey collected) to April 24, 2020 (last survey collected in 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. Randomisation 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.

2.1 Instruments

Demographic Questionnaire

Information concerning 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 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; Padron et al., 2012; Patel et al., 2008). It is categorised 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) behavioural disengagement, (8) venting, (9) positive reframing, (10) planning, (11) humour, (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).

2.2 Data Analysis

IBM SPSS was used for all data analyses. Data were analysed 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 if there was any significant difference 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 if 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. Bonferroni correction was performed as appropriate.

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3. Results

Data was gathered from 703 participants and screened for outliers using a repeated measures design, dependents together boxplot. Eighteen participants were identified as having given responses outside of accepted limits, and 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 $\alpha=.80$), the 12-item GHQ (sub-scales of 6-item Social Dysfunction $\alpha=.84$; 4-item Anxiety and Depression $\alpha=.73$; and 2-item Loss of Confidence $\alpha=.78$), and the 28-item Brief COPE (sub-scales of 10-item Emotion-focused $\alpha=.81$; 6-item Problem-focused $\alpha=.78$; and 12-item Dysfunctional strategies $\alpha=.80$). Therefore, all measures were considered to provide robust levels of reliability within the study.

3.1 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 sub-scales as predictor variables. This analysis included data from 366 participants who completed all measures on the scale. Descriptive statistics for the sub-scales (Table 1) and correlations between measures (Table 2) are presented below, alongside collinearity test results (Table 3).

Table 1: *Sub-scale 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 sub-scale 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 sub-scale 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

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).

Table 4: *Regression coefficients for questionnaire sub-scale measures*

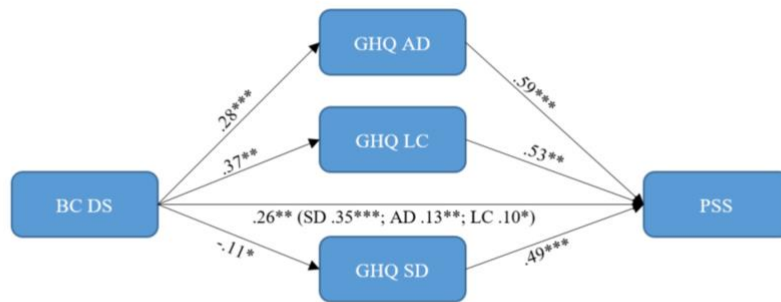
Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>
GHQ SD	.48	.07	.31	<.001
GHQ AD	.81	.12	.35	<.001
GHQ LC	.55	.20	.15	.006
BC EF	-.07	.06	-.06	.29
BC PF	.06	.10	.04	.54
BC DS	.20	.05	.19	<.001

3.2 Mediation Analysis: Overall

As 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 standardised regression coefficient between BC DS scores and GHQ SD scores was statistically significant, as was the standardised coefficient between GHQ SD scores and PSS scores. The standardised indirect effect was $(-.11)(.49)=-.05$, with a Sobel test of the mediation effect found to be significant $(-2.78, p<.01)$. The standardised regression coefficient between BC DS scores and GHQ AD scores was statistically significant, as was the standardised coefficient between GHQ AD scores and PSS scores. The standardised indirect effect was $(.28)(.59)=.17$, with a Sobel test of the mediation effect found to be significant $(5.13, p<.001)$. The standardised regression coefficient between

BC DS scores and GHQ LC scores was statistically significant, as was the standardised coefficient between GHQ LC scores and PSS scores. The standardised 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

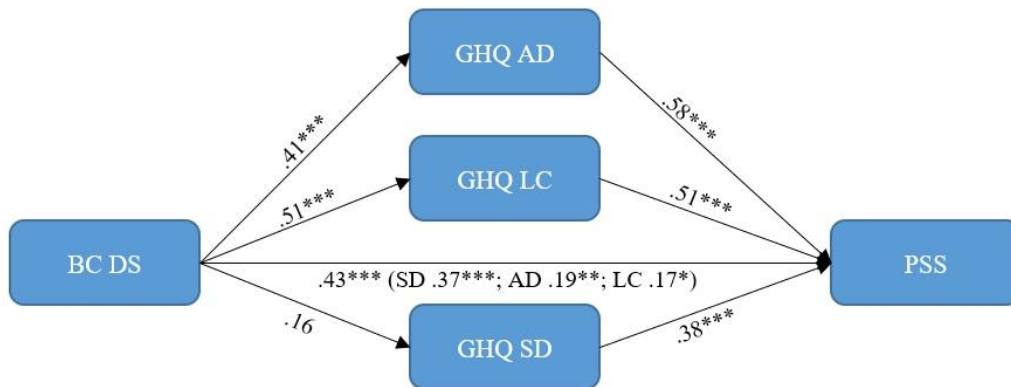


Note: Standardised regression coefficients for the relationship between scores on BC DS and PSS as mediated by scores on GHQ subscales SD, AD, and LC. The standardised regression coefficients between BC DS and PSS, controlling for GHQ subscale scores, are in parentheses.
 * < .05 ** < .01 *** < .001

3.3 Mediation Analysis: Cultural Differences

To examine whether individualistic or 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 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.

Figure 2: Individualistic culture mediation of BC DS by GHQ measures on PSS

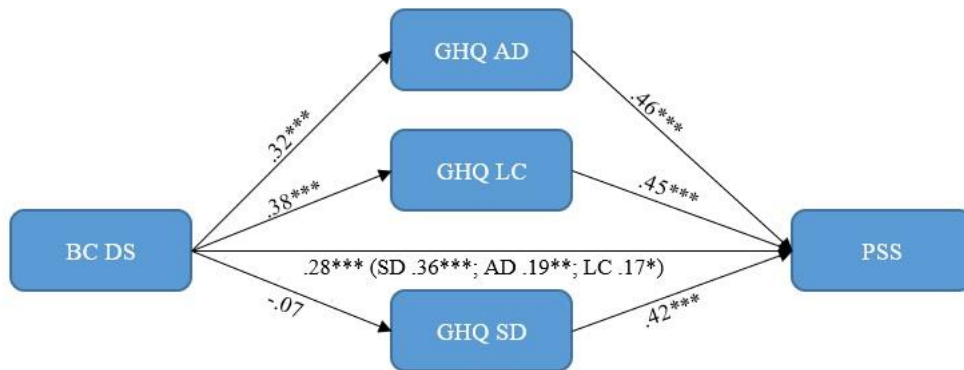


Note: Standardised regression coefficients for the relationship between scores on BC DS and PSS as mediated by scores on GHQ subscales SD, AD, and LC. The standardised regression coefficients between BC DS and PSS, controlling for GHQ subscale scores, are in parentheses.

* $<.05$ ** $<.01$ *** $<.001$

For individualistic cultures, the standardised regression coefficient between BC DS scores and GHQ SD scores was not statistically significant, whilst the standardised coefficient between GHQ SD scores and PSS scores was significant. The standardised indirect effect was $(.16)(.38) = .06$, with a Sobel test of the mediation effect found to be significant $(4.08, p < .001)$. The standardised regression coefficient between BC DS scores and GHQ AD scores was statistically significant, as was the standardised coefficient between GHQ AD scores and PSS scores. The standardised indirect effect was $(.41)(.58) = .24$, with a Sobel test of the mediation effect found to be significant $(3.67, p < .001)$. The standardised regression coefficient between BC DS scores and GHQ LC scores was statistically significant, as was the standardised coefficient between GHQ LC scores and PSS scores. The standardised indirect effect was $(.51) = .26$, with a Sobel test of the mediation effect found to be significant $(3.56, p < .001)$.

Figure 3: *Collectivistic culture mediation of BC DS by GHQ measures on PSS*



Note: Standardised regression coefficients for the relationship between scores on BC DS and PSS as mediated by scores on GHQ subscales SD, AD, and LC. The standardised regression coefficients between BC DS and PSS, controlling for GHQ subscale scores, are in parentheses.

* $<.05$ ** $<.01$ *** $<.001$

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

3.4 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 sub-scale scores. Mean scores for each dependent variable were used as opposed to total scores to allow for direct comparison across sub-scales. Levene's Test for sub-scales showed breaches for the SD and LC sub-scales of the GHQ across cultures and so these were removed from the subsequent analysis, and moderate correlations were found among the dependent variables. There was a significant difference between cultures on the combined measures, $F(5,327)=23.04, p<.001$; Wilks' Lambda = .74. Analysis of each individual dependent variable, using a Bonferroni adjusted alpha level of .01, showed that there were significant difference between 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.

Table 5: Mean scores on questionnaire items by country for questionnaire sub-scales

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

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

Finally, independent samples *t*-tests were calculated for each of the measures (*PSS*, *GHQ* sub-scales and *BC* sub-scales) and results are presented in Table 11. Apart from *GHQ LF*, which differed at a significant difference level of $p=.005$, all results showed significant differences $p<.001$.

Table 11: *Individualistic versus Collectivistic culture scores on measure sub-scales*

Measure	Ind Mean (SD)	Coll 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

4. Discussion There are multiple key findings 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 of 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 is consistent with previous literature (Demakis & McAdams, 1994; the American College Health Association, 2007). As expected, significant negative correlations emerged between both 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 have 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 with existing interrelations between dysfunctional coping behaviour and poorer psychological health (Mohr et al., 2014; Mahmoud et al., 2012; Main et al., 2011; Meyer, 2001; Penley et al., 2002; Holahan et al., 2005).

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 teaching coping skills could decrease psychopathology (Böke et al., 2019; Ghalechi & Movahhed, 2013; Anonymised 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 among students from individualistic cultures or countries found to be higher than in collectivistic cultures (see also Zhao & Zhang, 2018; Delfino et al., 2015).

These findings about individualistic versus collectivist countries merit further discussion. Collectivistic countries in this study successfully use more emotion- and problem-focused coping but also use more dysfunctional coping strategies. This tallies with limited and sometimes contradicting empirical studies related to culture and coping in the present literature (Lee & Mason, 2014; Kuo, 2011; 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 behaviours, often changing themselves in order to fit into the group rather than confront and modify the external stressors (Shulruf et al. 2007; Hofstede 2001)” (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 (Cole et al., 2002; Bjorck et al., 2001), 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 (Kuo, 2011; Shulruf et al., 2007; Hofstede, 2001), and have higher levels of group think (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 of lack of control, as they may have been given limited choice in the decision-making process during lockdown 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, suppress, 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 “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.

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 is echoed in extant literature (Liu et al, 2020; Horesh & Brown, 2020, p. 331; Qiu et al., 2020). Moreover, reduction of dysfunctional coping strategies during pandemics is essential as it can reduce depressive symptoms (Anonymised 2020b). 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 in frontline hospital workers (Anonymised 2020a). 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” of mental health issues. University students coincidentally fall into the age group where the prevalence of depressive and anxiety disorders is highest (Böke et al., 2019; Ribeiro et al., 2018), hence developing timely and continuous online screening tools and COVID-19 related psychological instruments (Anonymised 2020c) to identify “students with insufficient coping skills under chronic stress and at risk for mental health problems” needs to be prioritised (Delfino et al., 2015, p. 231; Mohr et al., 2014, p. 235). In addition, cultural differences need to be considered, as they can affect illness behaviour and have subtle effects on when, how, and how late people present to mental health services (Main et al., 2011; Anonymised 2020). Hence, since universities tend to be multicultural with students from many different cultures, students from different cultures may have varied distress and coping responses to pandemics. Interventions therefore may need to be designed to adapt to the specific needs of students from different cultures and studying in difference places.

This study naturally had limitations. First, it is just a cross sectional study that only recruited participants from the beginning of the pandemic. While this was an important time, follow-up and longitudinal studies might help further understand how university students might be coping with the pandemic or not. Next, the study looked at a limited number of participants. These participants were further divided into collectivist and individualistic countries making the comparison groups relatively small. It is recommended that future researchers replicate our study with much greater sample sizes and more countries and many different cultures. Furthermore, while students were currently studying in a stereotypically collectivistic or individualistic country, we did not measure their level of this variable. Indeed, it is likely that some participants studying in an individualistic country may be more collectivistic and vice versa (Parker et al., 2009). Future researchers could measure 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.

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

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