The relationship of Time Perspective with Depression, Anxiety and Stress across International Students in China during the COVID-19 Pandemic

Hafiza Komal Yameen[1]
[1] Department of Psychology, Southwest University, Chongqing, China.

ARTICLE INFO	ABSTRACT
	Individual differences in psychological relationships to time are the fundamental construction of time perspective (TP). Research suggests that TP is related to mental health. The question is whether balancing TP predicts mental health well-being in cross-culture studies. Considering the period of COVID-19 and several individual differences that might have significant psychological effects. A cross-sectional, web-based survey study was conducted among international students (N=228) who enrolled at Chinese universities. The participants were recruited through convenient sampling. Following informed consent, demographic variables, depression, anxiety, and stress scales were used. Later on, reliability, correlation, and regression analysis were conducted to examine the association between variables. Results show a strong positive relation between Past Negative (PN) TP with anxiety, depression, and perceived stress. Present Fatalistic (PF) also shows a significant relation with anxiety. While TPs' dimensions Past Positive (PP) and Future (F) negatively significant with depression. Our study illustrates that balancing one's own temporal perspective decreases the chances of being mentally sick. This suggests that manipulative TP profiles are tailored to mental health. Thus, TP profiles may impact conditions that are characterized to achieve the desired behavioral outcomes in periods of uncertainty.

Corresponding Author: Hafiza Komal Yameen (Email: komalyamin@gmail.com)

INTRODUCTION

Researchers in the last few decades have begun to investigate mental health issues and devise solutions to the problems that come with being mentally ill. Since the interpretation of a wide variety of phenomena connected to mental health concerns has proven to be highly reliant on their circumstances, a healthy mindset is announced to be a healthy lifestyle (Crum & Langer, 2007). Mental and behavioral disorders affects he World's population, whereas 4 to 41% accounted for PTSD, 7% accounted for depression of the global population after the outbreak (Torales et al., 2020).

The nature of the COVID-19 virus has made people vulnerable to stress, and it has led to mental health risks. Those who are careful in terms of healthy behaviors (Bogg & Roberts, 2004), engage in social distancing and personal hygiene (Reluga, 2010), and are contaminated by COVID-19 have higher levels of anxiety and fear (Abdelrahman, M. (2020). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR), anxiety disorder includes panic illness (frequent panic attacks, fear) and generalized anxiety disorder (prolonged intense worry). Persistent release of the stress hormone (cortisol) increases anxiety and can lead to major depressive symptoms (e.g., Ardayfio & Kim, 2006; McEwen, 2008). Similarly, during COVID-19, compliance, avoidance behavior, impulsivity (Sobol et al., 2020), and quarantine duration (Brooks et al., 2020) appeared to be the most predictive factors for symptoms of anxiety, stress, and depression. Previously, social distancing to avoid H1N1 contagion had also been reported to cause high levels of anxiety (Cowling et al., 2010). One of the papers on SARS (Severe Acute Respiratory Syndrome) shows that the high rate of emerging cases and protective measures against the spread of the disease resulted in moderate anxiety and a high risk of catching the disease (Leung et al., 2005). According to the study, during COVID-19, 25% of the population experiences moderate to severe stress or anxiety-related symptoms (Qiu et al., 2020; Wang et al., 2020).

Time has always been a fundamental mental category. According to Keough et al. (1999), TP is defined as "everyone has a primary focus on time, but they are unaware of the flow of time in which they live." To summarize the five TP dimensions, an individual with a positive focus on prior experiences is known as "PPTP". In contrast, someone with a negative focus on past failures and regrets is known as "PNTP." While PH refers to those who believe in living in the now, whereas PF refers to people who feel their lives are predetermined. Lastly, those looking forward to goals and aspirations are future-oriented (F) people (Zimbardo & Boyd, 2014; Akram et al., 2021).

Nevertheless, fluctuations in TP dimensions impact mental health risk. For instance, individuals who scored high on PN were positively correlated with anxiety and depression (Zimbardo & Boyd, 2014; Aslam et al., 2023) and negatively correlated with subjective happiness (Drake et al., 2008). However, high scores on PP are inversely correlated with depression as well as FTP (Anagnostopoulos & Griva, 2012; Parveen et al., 2022). Moreover, high scores in PH are associated with more frequent depression (Roseanu et al., 2008). Higher scores on the PF are positively correlated with depression and anxiety and negatively correlated with consideration of future consequences (Roseanu et al., 2008; Anagnostopoulos & Griva, 2012).

Numerous studies (Lai AY-K et al., 2020; Chen et al., 2020) have been conducted on several mental health risks. The studies mentioned above focus on only mental ailments like sleep disorders, mood disorders, and behavioral changes (Iftikhar et al., 2022; Aslam et al., 2021). Recently, a study (Kim & Kim, 2021) reported a prevalence rate of mental health risks, including sleep disorders (47.1%), anxiety (36.9%), and depression (49%). Even under normal conditions, international students are more vulnerable to physical health risks and seek psychological risks (Alharbi and Smith, 2018; Brunsting NC et al., 2018). Nevertheless, none of these studies addressed major primary mental health risks such as anxiety, depression, and stress concerning TP. However, there is a lack of expediency in calculating the role of TP in flourishing good mental health by calculating DBTP. Psychological health is always a concern among psychologists, psychiatrists, and clinicians. Poor mental health, as well as other factors such as environment and cultural background, frequently imply a low quality of life and some degree of impairment in various areas of life (Khansa et al., 2020; Aslam et al., 2020). Thus, there is a need to address the relationship between TP and mental health by using a sample of different ethnic and cultural backgrounds. Despite this, our study strengthens the previous findings from the time of the COVID-19 outbreak. However, the empirical work was carried out in a single nation and focused on the COVID-19 circumstance, but the evaluation was based on mood disorder was insufficient (Ahorsu et al., 2020; Aslam et al., 2022).

Nonetheless, it has been very difficult to show a strong correlation between anxiety and depression rather than with emotional and behavioral responses to the pandemic (Taylor et al., 2020). Some studies have found that the risk factors for disease spread cause anxiety and depression during an outbreak (Leung et al., 2005; Aslam et al., 2022). Therefore, the theoretical work of TP makes it possible to understand the relationship between the psychological perspective of time and mental health. Previously, cross-cultural studies analyzed diverse nations in separate samples. However, our study provides more insight into TP research from a single sample in a diverse cultural background. Moreover, the time of pandemic has had a great influence on individuals' thinking and behavioral patterns. Therefore, our study compiles data from international students living in China.

Nonetheless, no work has been done on exploring the relationship between mental health status and time perspective of international students or students stranded in foreign countries due to pandemic-related health risk measures or travel bans. Therefore, the main objective of this study was to explore the time perspective and mental health status of internal students. We also looked into the TP dimensions and its constructs, such as DBTP and DBTP-r, with mental health risks experienced by international students in a foreign country during the early period of the COVID-19 pandemic. It is crucial to understand the impact of these factors on the global environment influenced by the pandemic period.

RESEARCH METHODOLOGY
Design and Participants
The dependent variable was mental health, which included depression, generalized anxiety, and perceived stress, and the independent variable was TP, which included its five dimensions, PN, PP, PF, PH, and F and its constituents DBTP and DBTP-r. The design for this study is convenient sampling. A descriptive survey research method, i.e., an internet-based self-report survey. The target population (93 males and 135 females) between ages 18 and 40 (N = 228, M = 2.01, SD =.834) was international students living in China during the pandemic. The participants out of 48 countries include bachelors (34.2%), masters (47.4%), and PhD (18.4%) degree programs and year wise 1st year (39.9%), 2nd year (27.2%), 3rd year (11%), or 4th year (21.9%). None of the participants received any compensation for participation.

Measurements
Demographic information, including age, educational year, gender, and nationality, was investigated.

PHQ-9 (Patient Health Questionnaire: Kroenke et al., 2001), based on the DSM diagnostic criteria, was used to predict the presence of depression. All the items were in a 4-item Likert-type format, with one indicating "never" and four indicating "nearly every day." In this study, the PHQ-9 has exhibited satisfactory internal reliability (Cronbach's α = 0.774).

Generalized anxiety disorder (Generalized anxiety disorder, 2006) 7-item scale was used to predict the presence and severity of anxiety (Spitzer et al., 2006). It consists of a 4-point Likert scale used to address the severity of anxiety,

ranging from 0 (not at all) to 3 (nearly every day). Moreover, the GAD-7 scale has in this study, exhibited high internal consistency (α =0.828).

The 14-item Perceived stress scale (PSS-14) developed by Cohen in (1983) was used to assess feelings or thoughts during the last month in a 5-point Likert scale format, ranging from 0 (never) to 4 (very often). The scale showed good psychometric properties with α = 0.607 in this study.

The participants completed the original 56-item of ZTPI, which was used to assess different orientations of TP; namely, PP, PN, PH, PF and F (Keough et al., 1999). Every item indicates the extent to which each statement is characteristic or true on a 5-point Likert scale, ranging from very true (5) to very untrue (1). In addition, in this study, the scale has exhibited internal validity α values, ranging between 0.663 and 0.809. Moreover, PN (α =0.809), PH (α =0.736), PP (α =0.663), PF (α =0.707) and F (α =0.671) showed good reliability.

We calculated DBTP (Stolarski et al., 2011):

$$DBTP = \sqrt{(oPN - ePN)^2 + (oPP - ePP)^2 + (oPF - ePF)^2 + (oPH - ePH)^2 + (oF - eF)^2}$$

And DBTP-r (Jankowski et al., 2020):

$$DBTP - r = \sqrt{(1 - ePN)^2 + (5 - ePP)^2 + (1 - ePF)^2 + (3.4 - ePH)^2 + (5 - eF)^2}$$

Data Collection Procedure and Analysis Techniques
In order to collect the data, this study took five months, from April to August of 2020. The required questionnaire was distributed among international students via an online link through social media, while the filled questionnaire was then collected within the stipulated time for further data analysis. Data was analyzed regarding the reliability of the questionnaire, descriptive statistics, correlation, and regression analysis using the statistical package program (SPSS 24.0).

RESULTS
The detailed results of the study are presented in Tables 1-4.

Reliability and Characteristics of Participants
To check the internal consistency of all the measures and their constructs, we assessed the reliability of Cronbach's alpha by using the SPSS-25 version. The ZTPI scale with its five dimensions, such as PN =0.809, PH =0.736, PP =0.663, PF =0.707 and F =0.671 were found reliable. Mental health indicators for anxiety GAD-7 =0.828, depression PHQ-9 =0.774, and perceived stress PSS-14 =0.607 were also found to be reliable. Table 1 shows the reliability of all measures used in this study. The detailed results of this study are presented in Tables 1-4.

Table 1: Reliability of all measurements

Measures	No. of items	Cronbach's alpha α
PN	10	0.809
PH	15	0.736
PP	9	0.663
PF	9	0.707
F	13	0.671
GAD-7	7	0.828
PHQ-9	9	0.774
PSS-14	14	0.607

PN=Past Negative; PH= Present Hedonistic; PP=Past Positive; PF= Present Fatalistic; F= Future; GAD-7= = Generalized Anxiety Disorder; PHQ-9= = Patients Health Questionnaire; PSS-14= = Perceived Stress Scale.

Table 2 shows the demographic variables of participants. Frequency and percentage were reported for categorical data. The *M* and *SD* were reported separately for continuous data.

Table 2: Demographic Characteristics of study participants

Variable	Mean	SD	Frequency	Percent %
Gender:	1.59	.493		
Male			93	40.8
Female			135	59.2
Age:	2.01	.834		
18-23			63	27.6
24-29			115	50.4
30-35			35	15.4
36-41			15	6.6
Educational Level:	1.84	.710		
Bachelor			78	34.2
Masters			108	47.4
PhD			42	18.4

Year of Education:	2.15	1.170		
1st year			91	39.9
2nd year			62	27.2
3rd year			25	11.00
4th year			50	21.9

Frequency and Percentage are for categorical variables and mean and SD are for continuous variables.

Descriptive Statistics and Correlation Analysis
In order to assess the relationship between TP and mental health, a Bivariate Pearson correlation analysis was carried out for the sample, presented in Table 3.

Generalized anxiety was found to be positively correlated with PN ($r=.209$, $p<.002$) and PF ($r =.134$, $p <.043$), implying that as anxiety increases, so does PN and PF increases. While depression is also positively correlated with PN ($r=.139$, $p<.037$). Perceived stress showed strong correlation with PN ($r=.205$, $p<.002$) PP ($r=.218$, $p<.001$), DBTP ($r=.158$, $p<.017$) and DBTP-r ($r=.159$, $p<.017$). The results of correlations revealed that among TP profiles, PNTP is significantly correlated with generalized anxiety, perceived stress and depression. In contrast, PF only correlated with generalized anxiety among international students during the COVID-19 period.

Table 3: Descriptive statistics and correlation for all variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Gender	1													
Edu level	-0.009	1												
Age	-0.013	.248**	1											
YOEdu	0.037	-.157*	0.008	1										
GA	0.049	-0.021	-0.001	0.040	1									
D	0.003	-0.064	0.013	0.008	.739**	1								
PS	-0.025	0.026	-0.069	-0.056	.396**	.373**	1							
PN	0.059	0.026	0.044	0.058	.209**	.139*	.205**	1						
PF	0.083	-0.017	0.029	-0.069	.134*	0.091	0.078	.673**	1					
PH	-0.033	0.033	0.010	0.091	-0.010	0.039	0.128	.453**	.440**	1				
PP	0.049	0.064	-0.006	0.023	-0.032	-0.064	.218**	.508**	.386**	.527**	1			
F	-0.036	0.075	0.095	-0.018	0.000	-0.069	0.101	.199**	.219**	.576**	.374**	1		
DBTP	-0.011	0.087	0.074	-0.012	-0.009	-0.071	.158*	.338**	.320**	.651**	.657**	.943**	1	
DBTP-r	-0.010	0.087	0.074	-0.012	-0.008	-0.070	.159*	.341**	.323**	.653**	.659**	.942**	1.000**	1
Mean	1.59	1.84	2.01	2.15	6.768	8.246	17.123	2.921	2.865	3.040	27.228	41.460	44.070	43.059
SD	0.493	0.710	0.834	1.170	4.789	5.139	4.432	0.784	0.702	0.576	5.348	7.320	7.759	7.761

Edu level= Educational level; YOEdu= Year of education; GA= Generalized Anxiety; D= depression; PS= Perceived stress; PN=Past Negative; PH= Present Hedonistic; PP=Past Positive; PF= Present Fatalistic; F= Future; DBTP= Deviation from Balanced Time Perspective; DBTP-r= Deviation from Balanced Time Perspective revisited.

Regression Analysis
From the correlation analysis, it is revealed that the TP dimensions are related to mental health. To evaluate the strength, linear regression analysis used the enter method to analyze the relationship between the dependent and independent variables. The dependent variables (perceived stress, generalized anxiety and depression) were regressed on the predicting variables (Independent variables) of TP constructs: PN, PP, PH, PN, F and DBTP and DBTP-r.

Table 4: Summary of enter regression analysis predict mental health

Model	DV	IV	R2	F	Beta	t	Sig
1	Perceived Stress	PN	0.069	2.724	0.210	2.180	<0.030
		PF			-0.124	-1.343	0.181
		PH			-0.016	-0.171	0.864
		PP			0.159	0.356	0.722
		F			0.050	0.051	0.960
		DBTP-r			-0.015	-0.012	0.990
2	Generalized Anxiety	PN	0.079	3.168	0.331	3.457	<0.001
		PF			-0.001	-0.007	0.995
		PH			-0.103	-1.120	0.264
		PP			-0.586	-1.320	0.188
		F			-0.892	-0.904	0.367
		DBTP-r			1.172	0.964	0.336
3	Depression	PN	0.078	3.098	0.243	2.535	<0.012
		PF			-0.053	-0.575	0.566
		PH			0.113	1.234	0.218
		PP			-1.283	-2.886	<0.004
		F			-2.575	-2.606	<0.010
		DBTP-r			3.060	2.514	<0.013

PN= Past Negative; PH= Present Hedonistic; PP=Past Positive; PF= Present Fatalistic; F= Future; DBTP-r= Deviation from Balanced Time Perspective-revisited.

The generalized anxiety significantly predicts PN (6, 221) = 3.168, *p* <0.01, While perceived stress showed significant relation with PN (6, 22) = 2.724, *p*<0.030. While depression is positively significant with PN (6,221) = 3.098, *p*<0.012 and negatively significant with PP (*t*= -2.886, *p*<0.004) and F (*t*= -2.606, *p*<0.010), which indicates that TP's dimensions (PN, PP, PF and F) have a significant relationship with mental health. While PH did not show any relation with any mental health, as shown in Table 4.

Thus, regression analysis shows that there is a relationship between TP and mental health disorders (generalized anxiety, perceived stress and depression), supporting our first hypothesis. It means that a negative TP profile (PN and PF) and mental health problems have a positive correlation, specifically in the case of generalized anxiety. At the same time, PP and F showed a negative correlation in the case of depression have a link and were discovered among international students during the COVID-19 period. Surprisingly, DBTP was not retained in the final regression model. However, DBTP-r showed a strong correlation with depression *p*<0.013. This indicates that TP has an important predictive effect on mental health.

DISCUSSION

This is the first study to examine the relationship between TP and mental health ailments of international students stranded in China due to pandemic health precautions or travel bans. In the general population, the worldwide prevalence of major depressive disorder is 20.60 % (Hasin et al., 2018), and anxiety disorder is 7.30% (Stein et al., 2017). During the period of the pandemic, a study (Kim & Kim, 2021) reported a prevalence rate of mental health risks, including sleep disorders (47.1%), anxiety (36.9%), and depression (49%). However, the relationship between mental health and TP is yet ambiguous. Therefore, our first study highlights and discusses this matter of debate. Therefore, we built this research on the urgency of the time being to investigate the relationship between mental health and TP among international students. The significant finding of the current study was that the pandemic period adversely affected the perspective of time, which is why our participants' mental health was affected. None of the previous studies identified such a problem at the international level. The pandemic has led to a long break in the face-to-face study environment. Our significant findings indicate that the relationship between TP's dimension, DBTP, and DBTP-r is associated with mental health risk factors such as anxiety, depression and stress. Moreover, our findings are from diverse groups in terms of ethnicity, culture, and background, showing a good fit result that corresponds with the previous research.

In a recent study conducted in China (Ma et al. 2020), a cross-sectional online survey reported mental health problems, including perceived stress, depression, and anxiety among healthcare professionals specific to those working in hospitals. Other studies (Zhao et al., 2021) have shown that exposure to the COVID-19 pandemic stressors resulted in poor sleep quality with moderating effects on self-esteem and mediating effects of anxiety. Contrarily, our study shows that most of the participants suffer from moderate levels of stress that is strongly associated with depression.

Stress refers to an experience of emotions that emerge in the wake of physiological, biochemical, cognitive, and behavioral changes (Baum, 1990) under strain in order to cope with the environmental demands that account for an illness (Chen et al., 2020). Vinkers et al. (2020) proposed that self-isolation in COVID-19 causes stress due to negative emotions. The risk of getting infected is high, and the epidemic would persist for a long period of time, so people were encouraged to monitor the risk factors of catching the virus to maintain a healthy mental and physical wellbeing (Rubin et al., 2009). Likewise, our study revealed the relation between mental health risk and an increase in TP dimensions, i.e. PN and PF.

The concept of BTP was initiated in the field of positive psychology, claiming that "a blend of time orientations would be adaptive and depending on external circumstances (Boniwell & Zimbardo, 2015). Research shows that BTP positively predicts wellbeing (e.g., Stolarski, 2016; Zhang et al., 2013). BTP individuals are more satisfied and have more positive life experiences. Therefore, much research has done on the psychological implications of how people reflect on and deal with their past (e.g., Dickey, 1975; Trommsdorff et al., 1979; Szpunar, 2010) as well as on the psychological implications of how people react and deal with their past (e.g., Webster & Cappeliez, 1993; Webster, 1998; Cappeliez et al., 2005; Bryant et al., 2005; Webster et al., 2010). Nonetheless, comprehensive techniques that cover all three time zones simultaneously are uncommon. Therefore, our study highlights TP 5-dimensional structure: (1) PN refers to pessimistic time positively related to generalize anxiety, depression and perceived stress. That shows that with the increase in PN students are vulnerable to more towards generalized anxiety, depression and perceived stress. (2) PF refers to fatalistic about the present time and is positively related to generalize anxiety. It means that with the increase of PF students are more prone to have generalized anxiety. (3) F refers to goal-oriented time, and it is negatively associated with depression. It means that with an increase in FTP, depression decreases, as

in the case of (4) PP, which refers as positive about the past, while (5) PH does not have any significant relation with any mental health as it relates to psychological wellbeing.

In a similar perspective, the results reported the existence of psychological problems during COVID-19, which was also found in the general population of China in the early stages of COVID-19, than those in the non-epidemic period (Wang et al., 2020). However, our result indicated a significant relationship between mental health and TP dimensions, proving the relationship of the above-mentioned variables as presented by Sobol-Kwapinska et al. (2019). Whereas, the effect of perceived is the main underlying mechanism that explains the risk on mental health as in a previous study by Li and Lyu (2021). This could be possible with profound stress, anxiety, or depressive symptoms that occurred after the COVID-19 lockdown. Individuals with pre-existing anxiety-related disorders were found to be more vulnerable to the negative effects of COVID-19 than those with mood disorders or no mental disorders at all (Asmundson et al., 2020). The results are in line with previous research. Thus, our hypothesis 1 was how is the relation between subscales of ZTPI and mental health (perceived stress, anxiety, and depression) during COVID-19 (can previous findings be confirmed in a wide cultural sample)? is accepted.

Our findings also add context to the research identifying mental health risk factors by showing the deviation from one's own balanced each TP dimension. BTP "offers optimal mental health" (Boniwell & Zimbardo, 2015). Balancing one's TP allows one to remain relatively impartial while transitioning between multiple temporal horizons in response to situational demands. Moreover, for balanced and unbalanced TP, we used DBTP and DBTP-r. While trying to show the relationship between DBTP and DBTP-r, we have found that DBTP-r has shown the most significant and strong relation with psychological health indicators, as suggested by previous studies (Jankowski et al., 2020). DBTP was not retained in any final regression model. DBTP was not retained in any final regression model. Among DBTP and DBTP-r, DBTP-r has shown a good fit model in regression analysis in study 1. Thus, it accepts our second hypothesis that DBTP-r shows a stronger relation than DBTP. Moreover, DBTP-r is more strongly related to mental health and TP dimensions than DBTP.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS
The present study is the first one, which shows the relationship between TP, its constructs and balanced and unbalanced constituents and mental health together with generalized anxiety, depression and perceived stress. Apart from our findings, our current study also retains some limitations in study one, such as (1) the collected sample in study 1, a wide range of subjects were selected worldwide to form a sample. However, the subjects are still somewhat limited and a little far-fetched in representing countries' overall level. (2) The data collection occurred among the enrolled international students living in China. Further studies involve the Chinese students' sample and so make comparisons. (3) For research studies, the researchers were compelled to administer the questionnaire among the participants through online survey research rather than face-to-face as a result of being at the peak time of the pandemic. It would not allow participants to leave blank items. Therefore, when some subjects have questions that cannot be answered, they are forced to submit the questionnaire, and the answers may not align with the real situation. We suggest that further studies may compile results of collecting data face to face so those who face difficulties may have the choice to ask or leave it blank, which may get good results by controlling the other environmental factors. (4) Since this research has a role in promoting the TP research, its innovation is slightly insufficient. Moreover, future innovative research can be considered through a longitudinal study. (5) For the data analysis, we used the perceived stress scale (PSS-14) in the study to measure stress, which does not distinguish the type of stressor since stressors may represent socioeconomic status, immigrants and minorities already passing through it. The secondary stressor would be a pandemic that shapes their acute and immediate psychological response that impacts their future (Abdelrahman, M. 2020). (6) In addition, the gender ratio was not controlled; there were more females than males, resulting in an unbalanced gender ratio; researchers appeal for further studies to be conducted while controlling gender in the future. (7) Finally, several life experience factors contribute to mental health (Cheung et al., 2020). Future studies should examine the influence of specific life experiences, such as sickness, frustration, and economic conditions, among students at various educational levels.

Given these limitations, our current study appeals to the research aspirants and readers to expedite these research areas in the future to obtain an optimal result.

CONCLUSION
In conclusion to our study, we sought to investigate the relation between TP and three main primary mental health disorders, i.e. anxiety, depression and perceived stress. The relationship between TP and mental health was found to be consistent, as were the differences in cultural background and the nature of time (time of pandemic). We suggest that Individuals with PN are prone to be mentally sick by means of depression, anxiety and stress. We argue that PN would be the main reason for mental health risk. However, despite other mental health (depression and anxiety), perceived stress has shown a more significant relation with PNTP and PPTP and DBTP-r. Depression shows a

significant negative relation with PPTP and FTP and a positive relation with PN in regression analysis. Moreover, our regression analysis revealed that PNTP was found to be the most considerate relation with perceived stress, anxiety and depression among international students. Summarizing the above findings from the study, we suggest that individuals who are more biased towards TP past dimension (PN) and present dimension (PF) are prone to have more mental health risks, e.g. depression, anxiety and stress. In contrast, the F TP dimension plays a role in decreasing mental health risks. While DBTP-r found a strong association with mental health (depression, generalized anxiety and perceived stress) rather than DBTP.

Overall, the present findings represent some of the first to demonstrate the relationship between TP and mental health and how mindfulness interventions can alter the perception of time and mental health. We also show that the TP is ideally suited to an in-depth investigation of the mechanisms underlying this effect.

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