

Culture, Virus, Anxiety: Global Anxiety Level during the COVID-19 Pandemic Using a Cultural Lens

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Abstract. The world average anxiety level has increased since the 2019 outbreak of the new coronavirus. Although there are many studies on pandemics and anxiety levels, few have examined predictors of anxiety during the pandemic and possible pathways of influence, specifically comparing regional differences under different cultural influences. This paper argues that culture and cognition as the two main predictors of rising global anxiety levels, as well as provides an analysis of panic buying as an example of maladaptive anxiety, through a re-analysis of the existing literature. The findings of the paper suggest that culture, especially when recruiting participants from multiple countries and regions, is an essential factor in conducting psychological research. One of the limitations of previous studies is the lack of data across all phases of COVID-19. Future research should conduct longitudinal studies to examine the dynamic changes over time. The results could contribute to the study of the mental health of culturally diverse groups affected by the pandemic.

Keywords: culture; anxiety; coping styles; COVID-19 pandemic.

1. Introduction

In 2019, a new type of coronavirus broke out all over the world, causing great stress of the pandemic. According to the definition, expected stress could result in intense emotional responses, namely anxiety [1]. Although anxiety per se is of evolutionary meaning, chances are that it will trigger maladaptation when it was constantly stimulated [1]. On top of this, studies have shown that anxiety of the pandemic could predict all kinds of coping styles, which could be problematic on both individual and social levels [2]. Even in post-pandemic times, stress and trauma are not easy to get rid of [3]. Therefore, as a long-lasting threat, the risky mechanisms of exposure to the COVID-19 pandemic should be paid more attention to. Although extensive research has been carried out on examining the potential relationship between the pandemic and anxiety level, little has investigated possible influence paths of predictors, especially using an inclusive cross-culture lens. As a global pandemic, the generalizability of findings in certain regions or cultures could be greatly limited thus requiring special consideration of the differences among residents worldwide. This paper attempts to provide an overview of cross-cultural research exploring the pandemic and anxiety levels in multiple countries and regions by analysing methods and results from relative studies. While there is a growing body of literature recognising the importance of a cross-cultural perspective, it is vital to identify its role in this unusual period as more understanding is fundamental to anxiety and pandemic studies across the world. This review can provide some suggestions to the design of culturally based interventions for at-risk populations.

2. Macro-Perspective: Influences of Culture and Country Backgrounds

2.1 The Significance of Culture and Country Backgrounds for Cross-Cultural Anxiety Explanations

Predicting the anxiety levels of the residents living in a certain condition could be achieved by examining a country's cultural features and power distribution, which could also strongly affect the explanatory power of other possible factors. The traits of cultural backgrounds and government decisions could be operationalized by using the Hofstede model, a numeric scale inducing cross-cultural differences into multiple dimensions [4]. In broad terms, individualism and collectivism

respectively refer to societies in which members are loosely connected, who merely provide care to their most close relatives and friends, or united and tight-knit societies that require mutual protection and loyalty [4]. Power distance can be described as the degree to which organisation and institution units (e.g., families) with less power could tolerate and demand unequal power distribution, namely the inequality level defined from the lower rungs of the social power ladder [4]. In a study set out to investigate factors that could be associated with increased anxiety levels in 23 countries during the early stages of the COVID-19 pandemic, based on regression analysis of each country's performance on the Hofstede Scale and two anxiety scales, researchers found that countries with higher individualistic scores were also more anxious (e.g., Italy and Canada), and vice versa (e.g., Indonesia, Nigeria, Thailand, and Malaysia) [4]. Moreover, in terms of countries such as Italy and Canada, which were low in power distance, their residents also tended to feel more anxious in comparison [4]. It is also worth noting that many anxiety level predictors considered to be universal in the pandemic were found limited, and thus should be applied with careful consideration of cultural differences. For instance, personal and demographical predictors were having significantly varying effects on the anxiety levels of participants from diverse cultural backgrounds [4]. For such factors, mutually predictable or correlated relationships were not significant among them, as well as between them and individualism or collectivism, and/or power distance. That is to say, even under the similar cultural category and power distance conditions, the anxiety levels of residents in two (or more) countries may show different correlations with the same predictors, while certain factors may predict anxiety levels in countries that differ widely. Furthermore, on top of the Hofstede scale scores, the incidence of anxiety was significantly correlated with regional characteristics. The study has demonstrated that Latin America, regions with military conflict and high incomes were more prone to anxiety than other regions, and Asian participants had lower anxiety scores [4]. From the perspective of social conditions, the probability of these three characteristics overlapping in one country or region is not high, while distinct regions with one or more characteristics all tend to show higher levels of anxiety; although Asian regions are mostly collectivist countries that score low in power distance, the population are not necessarily more anxious. Therefore, although political, economic and social stability is closely related to mental health during the epidemic, the role of culture cannot be ignored. The study also examined the relationship between many micro-predictors and anxiety (e.g., gender, cohabitation, etc.) and found that the predictors did not provide a valid or general explanation for anxiety levels when not considering cultural background.

When estimating the explanatory role of culture on anxiety levels in different countries, it is essential to note that the influence of culture on social contexts is one of the core ways in which culture manifests in human behaviours and responses. The concept of social context is mainly composed of social approval and social norms, which are the goals and criteria that social members modify their conduct and thoughts to accomplish, particularly when people lack understanding of their own circumstances [5]. Regarding the COVID-19 pandemic, study results have supported the relationship between living in varied social contexts and anxiety responses at different levels. Based on statistics from multiple global indexes and datasets, a researcher has provided related analysis using statistics collected from more than 50 countries [5]. The social contexts of each country were manifested by two aspects including national variables, such as development and social preferences, as well as pandemic-containing restrictive actions. Anxiety levels were derived from responses of the participants on a range of specially developed scales. By establishing regression equations that control for different determinants, the researcher noticed from the results that members of societies with different characteristics experienced corresponding psychological outcomes in the face of the pandemic [5]. Based on controlling for other possible factors except for national variables, the findings suggested that regardless of their development level, social characteristics were an important aspect that influences mental health [5]. In terms of social tuning, the level of anxiety is inversely proportional to the overall level of patience and altruism in society [5]. This may be related to the different attitudes towards anti-pandemic policies. In the eyes of impatient citizens, the pandemic and government decisions forced them to change the pace of their lives, and the stringency and duration

of measures were often uncertain, leading to increased levels of anxiety in groups that were already more prone to anxiety and irritability than others. Policies such as home isolation and reduced outings reduced opportunities for members of the altruistic society to help others, thus making them feel anxious inside [5]. The degree of national development also had a significant correlation with the general level of national anxiety in the COVID-19 outbreak, as the comprehensive development level was negatively correlated with anxiety levels and was associated with cross-national differences [5]. Having said that, the pathway of developmental level on anxiety levels was not completely clear. This correlation could be related to differences in actual social development levels (specifically, during the pandemic it could be policies, welfare, etc.), or it could be a result of different perceptions regarding the pandemic of residents of countries with higher levels of development, or both, which is most possible since the results showed that residents in developed countries with better conditions of education, health and living standard had lower levels of anxiety, which was likely the outcomes of higher resource accessibility and egalitarianism.

In both studies, the researchers used macro-level variables to predict and explain the fact that global anxiety levels have globally risen during the pandemic. The results show that the individualistic/collectivistic characteristics of society, power distance, (perceived) government policies and social personality attributes in response to the outbreak are all related to changes in residents' anxiety levels. Most of the common predictors are related to culture, namely the dimensions of culture or widely accepted behavioural manners in a given society. At the same time, the development level of a country is also a factor that cannot be ignored. While the relationship between the two is not necessarily direct, more modernized societies are generally associated with healthier mental states. On the contrary, the explanatory power and generalizability of almost all proposed micro-influencing factors are weakened. With cultural and social contexts in consideration, differences at the individual level appear to be minor. Hence, cultural and social characteristics are important perspectives for interpreting psychological research, especially when multiple countries or regions are involved.

2.2 The Necessity of Culture and Country Backgrounds for Cross-Cultural Anxiety Explanations

According to The Inglehart-Welzel World Cultural Map, the world's regional cultures can be divided into eight clusters based on their position on the spectrum of values, representing diverse cultures all over the world [6]. In a two-phase study, researchers selected nine countries that are from six clusters in the World Cultural Map as cross-cultural study subjects of college students' mental health during the COVID-19 pandemic and predictors [6]. The nine countries and their value clusters are Slovenia, Poland, and the Czech Republic for the European Catholic region; Russia and Ukraine for the European Orthodox region; Germany for the European Protestant region; Turkey for the Islamic region of Africa; Israel for West and South Asia; as well as Colombia for Latin America [6]. While all nine countries are politically Western, most are located in Europe, and more than half are collectivist, it would be inappropriate to classify them into one category simply. These nine countries exhibit great cultural differences and uniqueness that are ultimately manifested in their local college students. Thus, data from university students in these countries can be largely representative of global student anxiety during the epidemic, and the analysis of predictors provides supporting evidence for the need for the cultural context in psychological studies.

In the first phase of the study, identified college students were recruited during the initial period of the pandemic to fill out a survey [7]. The results showed that Turkish college students had the highest anxiety scores, and German college students had the lowest [7]. For students in most countries, exposure to COVID-19, the impact of the pandemic on perceived well-being (e.g., personal finances, graduation plans, and interpersonal interactions), and health were correlated with their anxiety [7]. Moreover, in some countries, higher Standard and Poor's Global Ratings (S&P) and development levels were also associated with lower levels of anxiety (e.g., Germany), therefore a country's level of economic and social development can also have an impact on the psychological state (especially

anxiety level) of its college students [7]. For a study involving nine countries and six value clusters, even though some hypotheses can be supported, the results were complex and irregular, which exactly justifies the necessity to consider every cultural context. In the process of building predictive models, the researchers found that many of the predictors that were (strongly) correlated with anxiety levels in previous studies, such as gender, area of residence, and physical activity, were not universal. For many of the variables addressed in the questionnaire, it was common that they could only be used to predict certain countries, and/or one of depression or anxiety, and/or neither depression nor anxiety. Although the role of several predictors was determined, the researchers did not even succeed in explaining the anxiety levels of university students in Germany, Colombia and Slovenia [7]. Researchers suggest that the instability may be due to different priorities resulting from different social values [7]. In this study, all participants were attending college. As a highly homogeneous group and in the face of similar pandemic stress, because of objective differences in cultural backgrounds, their anxiety levels and predictors should be modelled in a specific manner, requiring delicate evaluations of their cultural and social conditions. Therefore, data and conclusions from one or few countries could be limited in generalizability, which emphasizes a cross-cultural perspective when interpreting study results.

In the second phase, new socioeconomic indicators were used to predict anxiety levels among university students in these nine countries during the COVID-19 pandemic [6]. The gender gap is a global issue, and inequality has been magnified again during the pandemic. In response, this study used a comprehensive evaluation system that measures gender equality which can be mutually corroborated with development levels [6]. The rapidly spreading virus forced governments to introduce assorted containment and mitigation measures, which were likely to be triggers for escalated anxiety and stress. The study adopted a newly developed tracker to evaluate the severity of national policies in terms of activity freedom, public hygiene and economic development. Of these nine countries, there were large gaps in each country's gender equality levels, and the Czech Republic had the most relaxed policy while Colombia had the most restrictive. Regarding scores on the three scales, the nine countries shared little similarities: The samples were extremely diverse, both culturally and socio-economically [6]. In this follow-up study, the risk of anxiety was highest among college students in Turkey and Poland and lowest among German students [6]. However, there were a few surprising patterns: On the individual level, although researchers also test multiple hypothesized predictors, such as gender, residential area, degree-pursuing etc., only gender could serve as a risk factor for anxiety level (the average GAD-7 score of females was significantly higher than that of males); On the national level, none of the variables was found related to mental health [6]. Compared to whether the restrictions per se are strict, individual perceptions of the "effectiveness, usefulness, protective value, and motivation to comply" of pandemic restrictions serve as more meaningful predictors of anxiety and stress. In this two-phase study, the participants were all university students from nine countries. As a highly similar group, although there must be differences between individuals, they are still special and homogeneous compared to other members of society. However, few factors consistently predicted their anxiety in the pandemic: At the individual level, several factors stably explained part of the increased anxiety; at the national level, none of the three dimensions the researchers selected was associated with anxiety. As a study involving six value clusters, cultural differences are an important factor in explaining these surprising results. Therefore, cross-cultural thinking is of necessity for anxiety research.

3. Micro-Perspective: Influences of Individual Perceptions

3.1 The Correlation Between Perception and Anxiety

Based on the cultural and power distribution keynote of the different countries, the governments have adopted a variety of responses and attitudes in the face of the COVID-19 pandemic, which, along with the government reputations, could also greatly influence the anxiety level of their residents. Given the results of the aforementioned study of 23 countries, the researchers conducted a follow-up

survey. Unlike before, the newly modified questionnaire asked participants to gauge their own governments, including the level of trust in official information and satisfaction with government-implemented policies against foreigners [8]. Further statistical analysis showed that anxiety levels were negatively correlated with both factors [8]. Interestingly, the correlations and their applicable countries are somewhat counterintuitive while reasonable: Doubts about official sources existed in both individualistic and collectivist countries, which were similarly associated with more symptoms of anxiety; Ratings of measures for foreigners could only significantly predict anxiety in Hungary and Russia (similarly, these two countries contains both individualism and collectivism), and people in the two countries who experienced more subjective apprehension also scored higher in disbelief in the government's response (or not feeling it was timely enough), as well as being more hostile and suspicious of foreigners [8]. The results of a follow-up study still found cross-cultural variation in anxiety scores and supported the significance of cultural variables in explaining anxiety levels [8]. Moreover, it is no denying that policies of local authorities are important predictors of mental health levels and can explain anxiety levels [8]. In the face of the impact of the epidemic, anxiety is a common response of human society and is affected by multiple factors, such as politics, economy, individuals, society, and culture [8]. In this study, anxiety is considered to be composed of four factors, including subjective cognition and objective experience, and as an influencing factor of the underlying cognition schema, culture has been changing the way of evaluating the world [8]. For instance, although the similar perception of pandemic policies did correlate with anxiety scores, it holds true for both individualistic and collectivist countries, thus stressing the importance of cross-cultural perspectives.

Similar factors and reasons may lead to different consequences as they are acting in different areas, which is supported by a study conducted in Thailand, Indonesia and Taiwan [9]. Although they should still be carefully considered as distinct areas with certain similarities, the three countries and regions are all located in South(east) Asia, and could all be characterized as collectivist cultures, thus sharing numerous resembling patterns. In the study, researchers aimed to explore factors related to higher anxiety performance in the three regions during the COVID-19 pandemic. Based on the Health Belief Model, researchers proposed independent variables for the study, roughly including confidence in controlling the pandemic, frequency of searching (asking) for related information, etc., to examine how were they related to participants' anxiety scores [9]. Overall, Thai university students mainly looked for related information via the internet and family members; they also had the most severe anxiety levels and the lowest confidence in pandemic management and accessible resources, which were argued by the researchers to be related to their anxiety [9]. University students in Indonesia liked to seek information from medical staff and family members, which was significantly correlated with their increased anxiety levels during the pandemic; more than participants in the other two countries and regions, they considered COVID-19 as a great threat and felt they were not receiving adequate support [9]. Taiwanese students were the least anxious, and the researchers speculated that this may be because the local government controlled the impact of the pandemic in time to ensure living needs; however, they were most negatively affected by information from social media and health professionals, which was indeed associated with increased anxiety symptoms in them, although their general anxiety levels remained "minor" compared to other countries and regions [9]. Therefore, different habits and preferences caused different perceptions, and even if in highly similar regions, the anxiety levels of the three places were not shared.

Based on the results of two studies, the role of perception in mental health is supported, and this holds true in a cross-cultural context, even as one of the few predictors of some generalizability. Participants from different cultures will have similar anxiety levels if they have similar perceptions of the same (and emotionally related) objects during the pandemic; participants from similar cultures can vary widely in anxiety levels if they have different perceptions of certain objects. Moreover, social traits are also influencing perceived anxiety. Residents of countries with higher levels of overall anxiety generally rated the pandemic as more dangerous and had more personal experiences during the period. In short, during the pandemic, anxiety was a common symptom of residents in different

cultural backgrounds, and it was more common and severe than before the epidemic. This phenomenon is the result of factors at different levels, such as individuals, society and culture.

3.2 Perception and Anxiety Behaviours

Since the COVID-19 pandemic outbreak, there has been ongoing unreasonable daily necessity hoarding around the world, typified by bulk purchases of toilet paper that have little to do with infectious disease protection. By definition, "panic buying" refers to the act of purchasing too many everyday items out of fear that they will run out or that prices will spike [10]. It has long reflected consumers' maladaptation in the face of stressors and is particularly obvious when normal life is restricted and there is little optimism about the future [10]. Under the immense pressure of the pandemic, panic buying became an unhelpful attempt to recapture a sense of control, and in turn, reflected the extreme anxiety of consumers [10]. In this global pandemic, what can be observed is that different cultures exhibit different characteristics of panic buying behaviour in response to comparable infectious disease threats.

The transactional model of stress and coping could explain the phenomenon [10]. When faced with stress, two stages determine people's response: In the primary appraisal, people assess the threat level of a stressor; if the stressor is considered close and requires vigilance, they move to the secondary appraisal, where people examine whether they have sufficient resources to cope [10]. Coping is usually divided into emotion-focused or problem-focused; the former indicates dealing with the negative emotions caused by the stressor, and the latter is with the stressor itself. In many cases, emotion-focused coping is considered a form of maladaptation and is ineffective. Therefore, as a method to merely release stress, panic buying is a typical example of maladaptive emotion-focused coping resulting from various reasons [10]. Previous literature has stated four triggers for it: Perceived threat and rarity of certain products, fear of future caused by anxiety, coping styles and social factors, such as resources or trust [10]. These four factors encompass multiple dimensions of panic buying, including the underlying cause (i.e., the presence of the stressor), the effect of two stages of cognitive appraisal on behaviour, and the role of social support in alleviating anxiety perceptions and anxious behaviour [10]. Individualism and collectivism can also have an impact on coping styles in a cross-cultural context. In this study, the United States is a typical individualistic country, while South Korea is a typical collectivist. In individualistic societies that are mindful of independence and freedom, resilience is the more accepted response because it is highly dependent on individual competence. High resilience reduces the level of anxiety more among Americans than among South Koreans. Living in a highly collectivistic society, South Koreans often seek help from social networks, especially for emotional support. In conclusion, although both the United States and South Korea experienced a trend of hoarding during the pandemic, reducing maladaptation may require different approaches in the two countries due to cultural intermediation.

The study used an online survey to collect data from adult customer research groups of market research companies in the United States and South Korea [10]. In the survey, participants were required to recall their life since the start of the pandemic and complete a series of screenings [10]. Data analysis showed that anxiety level was positively correlated with panic buying and was its significant predictor; social support was proportional to resilience and anxiety, and resilience was inversely proportional to anxiety. In terms of influence path, secondary appraisal affects panic buying by triggering emotional factors (namely, loneliness mediated by anxiety) [10]. Resilience can reduce anxiety levels and thus inhibit panic buying, while social support can both increase and decrease anxiety due to the specificity of the pandemic, and therefore needs to be contextualized. Resilience can significantly reduce anxiety in the U.S. compared to South Korea; social support has similar effects in the U.S. and South Korea. Greatly influenced by the threat of the COVID-19 pandemic, residents on this globe have experienced increased anxiety levels to varying extents while sufficient physical and psychological resources are not accessible to everyone, thus many people turn to emotion-focused coping that is sometimes in a maladaptive way. While the sources of social support may differ for consumers in the United States and South Korea, support from their own valued sources

leads to meaningful social support regardless of culture, relieving anxiety caused by stress and decreasing reliance on blind hoarding of goods [10]. Having said that, resilience and social support in the transactional theory of stress and coping will both help consumers avoid maladaptive stress coping methods (especially emotional-focus ones, which are more likely to result in maladaptation) and may conversely increase the negative emotions of consumers. Therefore, in either way and across cultures, there is a strong relation between stressors, anxiety and (mal)adaptation. Easing the negative emotions of consumers will play an important role in reducing maladaptation, although the most effective way is depending on cultural backgrounds.

4. Conclusion

In this investigation, the aim was to assess increased global anxiety levels during the COVID-19 pandemic using a cross-cultural lens. The paper has identified culture and perception as two main factors that are related to the generally deteriorating mental health worldwide, as well as panic buying as an example of uncontrolled anxiety and maladaptation, by reviewing the latest related literature. The insights gained could be of interest to research about cross-cultural mental health affected by the pandemic, and the findings of the paper indicate that culture, especially when examining data from multiple regions, is a key factor in conducting psychological research. Limitation of previous studies is the lack of information on statistics collected from all phases of the COVID-19 pandemic and certain cultures. Many of the studies had started at the beginning of the pandemic and all of them are cross-sectional studies, with participants recruited primarily from the first wave or so. Over time, most governments have begun to practice herd immunization models that promote coexist with COVID-19 after strict prevention and control policies, which may have an uncertain impact on the anxiety level. Further studies might look for data from different stages of the pandemic or conduct longitudinal surveys and lay more emphasis on cultures that are much less valued in the world.

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