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Mental Toughness and Emotional Distress among Chinese and Malaysian University Basketball Players: A Correlational Study

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Abstract

This study examined the relationship between mental toughness and emotional distress among university basketball players in China and Malaysia. A total of 132 male student-athletes participated in the study, including 66 players from Zhengzhou University of Technology (ZUT), China, and 66 players from Universiti Teknologi Malaysia (UTM), Malaysia. Mental toughness was assessed using the Mental Toughness Questionnaire-48 (MTQ-48), covering the dimensions of Challenge, Commitment, Control, and Confidence, while emotional distress was measured using the Depression, Anxiety, and Stress Scale-21 (DASS-21). As several variables were not normally distributed, non-parametric analyses were conducted, including Mann–Whitney U tests and Spearman correlation analysis.The findings revealed significant group differences across all mental toughness dimensions and emotional distress variables. UTM players scored higher in Challenge and Confidence (both $p < .001$), whereas ZUT players scored higher in Commitment and Control (both $p < .001$). Significant differences were also found in Stress ($p = .004$), Anxiety ($p < .001$), and Depression ($p < .001$). In the total sample, Control was the only mental toughness dimension significantly and negatively correlated with Stress ($r = -.193$, $p < .05$), Anxiety ($r = -.293$, $p < .01$), and Depression ($r = -.271$, $p < .01$). However, these associations were not consistently retained in the country-specific analyses. In contrast, Stress, Anxiety, and Depression were strongly and positively interrelated across all samples (all $p < .01$). Overall, the findings suggest that Control may be the most relevant protective dimension of mental toughness in relation to emotional distress among university basketball players. The study also highlights the importance of culturally sensitive psychological support in university sport settings.

Keywords: Mental Toughness, Emotional Distress, Depression, Anxiety, Stress, University Basketball Players

Introduction

University student-athletes are a special group in higher education because they need to cope with both academic responsibilities and sport-related demands (Hart et al., 2024; Parker et al., 2021). In addition to attending classes and completing academic tasks, they must also face daily training, competition pressure, physical fatigue, and performance evaluation. This dual demand may place a heavy psychological burden on student-athletes and affect their academic adjustment, sports performance, and overall well-being (Afifah et al., 2025; Santos et al., 2020). For basketball athletes, these challenges may be even more obvious because basketball is a fast-paced and highly competitive sport that requires continuous physical involvement, rapid decision-making, and psychological stability under pressure(Chmiel & Buryta, 2025). Therefore, paying attention to the mental health of university basketball athletes is of great importance for promoting athlete development and improving sports support in higher education.

Among the psychological problems faced by university student-athletes, emotional distress has received increasing attention in recent years (Mao, 2025; Sullivan et al., 2019). In particular, depression, anxiety, and stress are commonly regarded as important indicators of negative emotional states, and they may interfere with individuals' daily functioning and sport participation (Drew & Matthews, 2019). For university basketball athletes, higher levels of these emotional difficulties may affect attention, self-confidence, motivation, decision-making ability, and the ability to cope with competition pressure (Guo & Wang, 2025). If these problems are not identified in time, they may further affect training continuity, performance quality, and overall psychological adjustment (Joseph & Pennington, 2025). In this regard, the Depression, Anxiety, and Stress Scale (DASS) provides a useful framework for assessing emotional distress because it can measure three related but relatively independent dimensions of negative psychological experience (Crawford & Henry, 2003; Osman et al., 2012). Therefore, examining depression, anxiety, and stress is important for understanding the mental health of university basketball athletes.

In the basketball context, mental toughness is usually regarded as an important psychological resource because this sport requires athletes to perform continuously under high physical and psychological pressure (Pocius & Malinauskas, 2024). Basketball athletes not only need to maintain speed, coordination, and technical execution ability, but also have to cope with competition pressure, performance expectations, uncertainty during games, and setbacks such as mistakes, missed opportunities, or unfavorable results (Denul et al., 2025). Under these conditions, athletes with stronger mental toughness may be better able to stay focused, persist in difficult situations, regulate their emotions, and respond more effectively to pressure (Crawford et al., 2021). Therefore, mental toughness is considered to be closely related to athletes' ability to maintain commitment, confidence, challenge orientation, and sense of control in training and competition (Dagnall et al., 2021). For university basketball athletes who need to deal with both sport and academic demands at the same time, mental toughness may play a particularly important role in supporting their adaptation, performance, and psychological stability (Crawford et al., 2021).

Although mental toughness and emotional distress have received increasing attention in the field of sport psychology, studies on the relationship between these variables among university basketball athletes, especially in a cross-cultural context, are still very limited

(Aizava et al., 2023; Pachaiappan et al., 2025). Existing studies often focus on samples from a single country, or examine mental toughness or emotional distress separately (Aizava et al., 2023; Mao, 2025). Therefore, it is still unclear whether mental toughness and emotional distress show consistent relationships among university basketball athletes from different cultural backgrounds, such as China and Malaysia.

Against this background, the present study is motivated by the need to better understand how mental toughness is associated with emotional distress among university basketball athletes, a group that faces concurrent academic, training, and competition demands. By focusing on athletes from China and Malaysia, this study aims to compare levels of mental toughness and emotional distress between the two groups and to examine the relationships between these variables in the total sample as well as within each national group. This study contributes to the literature in three main ways. First, it provides cross-cultural evidence on the association between mental toughness and emotional distress among university basketball athletes. Second, it integrates between-group comparison and within-group correlation analysis within the same research framework, allowing a more comprehensive understanding of both group differences and relational patterns. Third, it offers practical implications for culturally sensitive psychological support, athlete monitoring, and intervention planning in higher education sport settings.

Methods

Research Design

This study adopted a quantitative cross-sectional research design to examine the relationship between mental toughness and emotional distress among university basketball athletes in China and Malaysia. At the same time, a comparative research approach was used to identify differences between the two national groups, and a correlational research approach was used to test the relationships between mental toughness and the DASS variables, namely depression, anxiety, and stress. This research design was chosen because it allows the researcher to measure the psychological characteristics of the participants at the same point in time and to compare the patterns shown in the Chinese and Malaysian samples.

Participants

The participants in this study were university basketball athletes from China and Malaysia, representing Zhengzhou University of Technology (ZUT) and Universiti Teknologi Malaysia (UTM), respectively. A total of 132 male student-athletes were recruited through purposive sampling, with an age range of 19 to 24 years, including 66 participants in the China group and 66 participants in the Malaysia group. Race was not used as a screening criterion in this study.

The inclusion criteria were as follows: participants had to be current university basketball athletes, male, aged between 19 and 24 years, physically healthy, with no known chronic or acute diseases, and without any injury or condition that could affect sports performance at the time of data collection. In addition, participants had to be regularly involved in university or club basketball training on a continuous basis. Participants were excluded from the study if they were younger than 19 years or older than 24 years, female, diagnosed with chronic or acute diseases, had injuries within the past 6 months that could affect sports performance, or were not regularly involved in basketball training.

The sample size of this study was estimated using GPower 3.1.9.2 software. This software is widely used for sample size and statistical power analysis in behavioral and social science research (Faul et al., 2009; Faul et al., 2007). Based on relevant literature in sport psychology and cross-cultural sport research, and with reference to the medium effect size reported by (Jones et al., 2007)(d = 0.50), this study used an independent samples t-test (two-tailed), with α = 0.05, statistical power = 0.80, and a group allocation ratio of 1:1 for the calculation. The result showed that at least 64 participants were required in each group, with a minimum total sample size of 128. To ensure sufficient statistical power for the questionnaire analysis, in addition to the participants who completed the physical fitness tests, this study recruited several additional participants, resulting in a final questionnaire sample of 66 participants from China and 66 participants from Malaysia, with a total sample size of 132, which was slightly above the minimum sample size requirement.

Instruments

Mental Toughness

This study used the Mental Toughness Questionnaire-48 (MTQ-48) to assess the participants' level of mental toughness. The MTQ-48 was originally developed by Clough et al. (2002), and it is one of the most commonly used instruments for measuring mental toughness in sport and performance-related research. This scale is based on the 4C model of mental toughness, which views mental toughness as a multidimensional construct including four core dimensions: Challenge, Commitment, Control, and Confidence.

The MTQ-48 contains 48 items in total and uses a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate a higher level of mental toughness. According to the original framework, the scale can provide scores for the four core dimensions, and these dimensions have been widely used in sport psychology research. Previous studies also showed that the Cronbach's alpha values for the four core dimensions were: Control (α = 0.71), Commitment (α = 0.80), Challenge (α = 0.71), and Confidence (α = 0.71) (Clough et al., 2002), indicating that the scale has good overall internal consistency.

DASS

This study used the Depression, Anxiety, and Stress Scale-21 (DASS-21) to assess the participants' emotional distress. The scale was developed by Lovibond (1995)and is a widely used self-report instrument for measuring three dimensions of negative emotional states: depression, anxiety, and stress. The DASS-21 contains 21 items in total, with 7 items in each subscale. Based on their actual feelings over the past week, participants rated each item using a 4-point Likert scale, ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). According to the recommendation of the original authors, the total score for each subscale was multiplied by 2 to maintain consistency with the scoring system of the original DASS-42. Higher scores indicate a higher level of emotional distress in that dimension. Lovibond (1995) reported that the scale has good internal consistency, with Cronbach's alpha values of 0.88 for depression, 0.82 for anxiety, 0.90 for stress, and 0.93 for the total scale.

Data Collection Procedure

The data in this study were collected from male university basketball athletes at Zhengzhou University of Technology (ZUT) in China and Universiti Teknologi Malaysia (UTM) in Malaysia.

Before the formal data collection, the researcher screened potential participants in advance according to the inclusion and exclusion criteria of this study, and only those who met the requirements were invited to participate. Before completing the questionnaires, all participants were informed of the purpose of the study and signed written informed consent forms. Participation was completely voluntary, and all questionnaires were collected anonymously.

The questionnaires were administered on site at the basketball court in an offline format. Eligible participants completed the questionnaires at the site, and the questionnaires were collected immediately after completion. During the data collection process, if any missing or incorrectly completed items were found, the researcher reminded the participants on the spot to check and complete them. This process helped improve the completeness and accuracy of the questionnaire data.

The survey included two instruments, namely the Mental Toughness Questionnaire-48 (MTQ-48) and the Depression, Anxiety, and Stress Scale-21 (DASS-21). After the questionnaires were collected, the researcher checked them again for completeness and whether they met the study requirements. Any questionnaire that did not meet the study requirements was excluded from the final analysis. The valid data were then coded and entered into SPSS 26 software for subsequent statistical analysis.

Data Analysis

All data were analyzed using IBM SPSS Statistics version 26. First, descriptive statistical analysis was conducted for all study variables. Then, the Shapiro–Wilk test was used to assess the normality of the data distribution. Since several variables did not meet the assumption of normal distribution, non-parametric statistical methods were used in the subsequent analyses.

The descriptive statistical results were presented as median and interquartile range (IQR). To test the group differences between university basketball athletes in China and Malaysia, the Mann–Whitney U test was used. In addition, Spearman rank correlation analysis was applied to examine the relationships between the dimensions of mental toughness and the emotional distress variables, including depression, anxiety, and stress, in the total sample and separately within each national group. The level of statistical significance was set at $p < .05$.

Ethical Considerations

This study has been approved by the Research Ethics Committee (UTMREC), ethics approval number UTM REC-2025-137 (confidential). All procedures in this study comply with the ethical requirements for research involving human subjects. All subjects were informed of the study purpose and signed informed consent forms before data collection.

Results

The results of the Shapiro–Wilk test showed that several variables, especially the DASS dimensions and some physical fitness indicators, did not meet the assumption of normality. Therefore, non-parametric statistical methods were used in the subsequent analyses. The Mann–Whitney U test was used for group comparisons, and Spearman rank correlation

analysis was used to examine the relationships between physical fitness indicators and emotional distress variables.

Descriptive Statistics of Mental Toughness and DASS Variables

Table 1 presents the descriptive statistics of the mental toughness dimensions and DASS variables among basketball athletes from ZUT and UTM. Overall, UTM athletes showed higher median scores in the Challenge and Confidence dimensions, with values of 3.62 (1.33) and 3.49 (0.80), respectively, while ZUT athletes showed higher median scores in the Commitment and Control dimensions, with values of 3.70 (0.50) and 3.57 (0.71), respectively. For the DASS variables, the median scores of UTM athletes were higher than those of ZUT athletes for Stress, Anxiety, and Depression, at 6.00 (13) vs. 3.00 (8), 8.00 (12) vs. 2.00 (6), and 5.00 (11) vs. 2.00 (4), respectively. In addition, the UTM group also showed wider score ranges in all three emotional distress dimensions, namely Stress: 0–40 vs. 0–24, Anxiety: 0–40 vs. 0–24, and Depression: 0–34 vs. 0–26. These results indicate that, compared with ZUT athletes, UTM athletes scored higher in challenge and confidence, while also showing higher median levels of negative emotional states.

Table 1
Descriptive statistics of mental toughness and DASS variables by group

Variable	Group	N	Median（IQR）	Min-Max
Challenge	ZUT	66	2.7800 (1.33)	1.44-4.22
	UTM	66	3.6150 (1.33)	1.44-4.89
Commitment	ZUT	66	3.7000 (.50)	1.50-4.70
	UTM	66	2.8500 (.50)	1.40-4.20
Control	ZUT	66	3.5700 (.71)	1.71-4.36
	UTM	66	2.7850 (.73)	1.79-3.93
Confidence	ZUT	66	2.6950 (.77)	1.56-4.09
	UTM	66	3.4850 (.80)	1.45-4.56
stress	ZUT	66	3.00 (8)	0-24
	UTM	66	6.00 (13)	0-40
anxiety	ZUT	66	2.00 (6)	0-24
	UTM	66	8.00 (12)	0-40
depression	ZUT	66	2.00 (4)	0-26
	UTM	66	5.00 (11)	0-34

Group Differences in Mental Toughness and Emotional Distress Variables

According to Table 2, the results of the Mann–Whitney U test showed significant group differences between ZUT and UTM athletes in all study variables. For the mental toughness dimensions, challenge ($U = 1274.00$, $Z = -4.120$, $p < .001$), commitment ($U = 757.00$, $Z = -6.474$, $p < .001$), control ($U = 632.50$, $Z = -7.037$, $p < .001$), and confidence ($U = 1034.00$, $Z = -5.207$, $p < .001$) all reached significant levels. Based on the median values in Table 1, UTM athletes scored higher in challenge and confidence, whereas ZUT athletes scored higher in commitment and control. In addition, for the DASS variables, stress ($U = 1559.50$, $Z = -2.847$, $p = .004$), anxiety ($U = 1366.00$, $Z = -3.750$, $p < .001$), and depression ($U = 1370.50$, $Z = -3.774$, $p < .001$) also showed significant group differences.

Table 2
Group differences between ZUT and UTM

	Challenge	Commitment	Control	Confidence	stress	anxiety	depression
Mann-Whitney U	1274.000	757.000	632.500	1034.000	1559.500	1366.000	1370.500
Z	-4.120	-6.474	-7.037	-5.207	-2.847	-3.750	-3.774
Asymp. Sig. (2-tailed)	< .001	< .001	< .001	< .001	.004	< .001	< .001

Note: Grouping Variable: Group.

Correlation Results between Mental Toughness and DASS in the Total Sample

Table 3 shows the Spearman correlation coefficients between the dimensions of mental toughness and the DASS variables in the total sample. Among the four dimensions of mental toughness, only control showed significant negative correlations with all three DASS variables, namely stress ($r = -.193$, $p < .05$), anxiety ($r = -.293$, $p < .01$), and depression ($r = -.271$, $p < .01$). In contrast, challenge, commitment, and confidence did not show significant correlations with stress, anxiety, or depression. Significant positive correlations were found among the DASS variables. Stress showed strong positive correlations with anxiety ($r = .769$, $p < .01$) and depression ($r = .815$, $p < .01$), and anxiety was also significantly positively correlated with depression ($r = .827$, $p < .01$). In addition, there were also some significant correlations among the dimensions of mental toughness, such as a positive correlation between challenge and confidence, and a positive correlation between commitment and control.

Table 3
Correlations between mental toughness and DASS in the total sample

Variable	Challenge	Commitment	Control	Confidence	stress	anxiety	depression
Challenge	1.000						
Commitment	-.095	1.000					
Control	-.192*	.423**	1.000				
Confidence	.381**	-.172*	-.297**	1.000			
stress	.033	-.064	-.193*	.099	1.000		
anxiety	.033	-.160	-.293**	.072	.769**	1.000	
depression	-.034	-.142	-.271**	.109	.815**	.827**	1.000

Note: Spearman's rho was used. N = 132. *p < .05, **p < .01.

Correlation Results between Mental Toughness and DASS in the China Group

Table 4 shows the Spearman correlation results between the dimensions of mental toughness and the DASS variables in the China sample. The results indicated that, in the China sample, none of the dimensions of mental toughness showed significant correlations with stress, anxiety, or depression. In contrast, significant positive correlations were found among the DASS variables. Stress was significantly positively correlated with anxiety ($r = .623$, $p < .01$) and depression ($r = .749$, $p < .01$), and anxiety was also significantly positively correlated with depression ($r = .785$, $p < .01$). In addition, within the mental toughness dimensions, challenge was significantly positively correlated with commitment ($r = .344$, $p < .01$), and commitment was also significantly positively correlated with control ($r = .289$, $p < .05$).

Table 4
Correlations in the China sample

Variable	Challenge	Commitment	Control	Confidence	stress	anxiety	depression
Challenge	1.000						
Commitment	.344**	1.000					
Control	.136	.289*	1.000				
Confidence	-.125	.068	.024	1.000			
stress	-.086	-.020	-.162	-.015	1.000		
anxiety	-.055	-.076	-.215	-.063	.623**	1.000	
depression	-.194	-.109	-.205	.028	.749**	.785**	1.000

Correlation Results between Mental Toughness and DASS in the Malaysia Group

Table 5 shows the Spearman correlation results between the dimensions of mental toughness and the DASS variables in the Malaysia sample. Overall, except for a weak positive correlation between commitment and depression ($r = .243$, $p < .05$), the other dimensions of mental toughness did not show significant correlations with stress, anxiety, or depression. At the same time, within the mental toughness dimensions, challenge was significantly positively correlated with confidence ($r = .496$, $p < .01$), while commitment was significantly negatively correlated with control ($r = -.260$, $p < .05$). Consistent with the results of the total sample and the China sample, the three DASS variables still showed significant positive correlations with each other, including stress and anxiety ($r = .863$, $p < .01$), stress and depression ($r = .851$, $p < .01$), and anxiety and depression ($r = .822$, $p < .01$).

Table 5
Correlations in the Malaysia sample

Variable	Challenge	Commitment	Control	Confidence	stress	anxiety	depression
Challenge	1.000						
Commitment	-.025	1.000					
Control	.008	-.260*	1.000				
Confidence	.496**	.068	-.036	1.000			
stress	-.037	.188	.110	-.049	1.000		
anxiety	-.132	.149	-.011	-.100	.863**	1.000	
depression	-.170	.243*	.039	-.128	.851**	.822**	1.000

Note: Spearman's rho was used. N = 132. *p < .05, **p < .01.

Overall, although significant group differences were found between Chinese and Malaysian university basketball athletes in the dimensions of mental toughness and DASS scores, the relationships between mental toughness and emotional distress were not stable within the grouped samples. In the total sample, only control showed significant negative correlations with stress, anxiety, and depression. However, when the analysis was conducted separately by country, these relationships became weaker or were no longer significant. In contrast, the relationships among stress, anxiety, and depression showed a strong and consistent pattern of positive correlations in the total sample, the China sample, and the Malaysia sample.

Discussion

Summary and Interpretation of the Main Findings

This study examined the relationship between mental toughness and negative emotional states (DASS) among university basketball athletes in China and Malaysia. The analysis showed several important findings. First, significant group differences were found between the Chinese and Malaysian athletes in all four dimensions of mental toughness and all three DASS variables. Specifically, Malaysian athletes showed higher median scores in the Challenge and Confidence dimensions, while Chinese athletes scored higher in Commitment and Control. In addition, significant differences were also found between the two groups in Stress, Anxiety, and Depression, suggesting that the psychological characteristics of university basketball athletes may be jointly influenced by different cultural backgrounds, training patterns, and university sport environments (Bell & Riol, 2017; Kassim & Boardley, 2018).

Second, in the total sample analysis, Control was the only dimension of mental toughness that showed significant negative correlations with all three DASS indicators. In other words, this result suggests that a higher sense of control may be related to lower levels of stress, anxiety, and depression. This finding highlights the potential protective role of Control in the psychological functioning of university basketball athletes (Dagnall et al., 2019). Compared with the other dimensions of mental toughness, sense of control seems to have a more direct relationship with the regulation of emotional distress, especially in environments where athletes must deal with training demands, academic tasks, and competition pressure at the same time (Crawford et al., 2021; Dagnall et al., 2021).

Third, when the China sample and the Malaysia sample were analyzed separately, the relationships between mental toughness and DASS were not stable. In the China sample, none of the dimensions of mental toughness showed significant correlations with the DASS variables. In the Malaysia sample, most of the correlations were also not significant, with only a weak positive correlation found between Commitment and Depression. These results suggest that the relationship between mental toughness and negative emotions may not be as direct as a simple linear relationship, but may be influenced by factors such as context, cultural background, or sample characteristics (Eubank et al., 2017).

At the same time, one highly consistent finding across all analyses was the strong positive correlations among Stress, Anxiety, and Depression. This pattern appeared not only in the total sample, but also in both the China and Malaysia sub-samples, indicating that negative emotional states in university basketball athletes often cluster together and occur at the same time, rather than appearing separately (Crawford & Henry, 2003). From a practical perspective, this suggests that basketball training and psychological monitoring should not focus on only one single emotional problem, but should assess athletes from the perspective of their overall emotional state.

Overall, the results of this study indicate that mental toughness is not a unified construct in which all dimensions play the same role. Rather, in the population of this study, some specific components, especially Control, may reflect athletes' emotional health better than the other dimensions (Poulus et al., 2020). At the same time, the instability of the correlations in the country-specific analyses also suggests that caution is needed when interpreting the relationship between mental toughness and DASS in cross-cultural university athlete samples.

The Role of Control as a Key Protective Dimension

One key finding of this study was that, in the total sample, Control was the only dimension of mental toughness that showed significant negative correlations with stress, anxiety, and depression. This suggests that, for university basketball athletes, the ability to regulate emotions and maintain a sense of control under pressure may be especially important for mental health (Poulus et al., 2020). Compared with Challenge, Commitment, and Confidence, Control seemed to show a clearer and more stable pattern of association with emotional distress (Malhotra & Kaur, 2017). From an applied perspective, this finding suggests that psychological training for university basketball athletes should place greater emphasis on the development of emotional regulation, attention control, and stress coping skills (Crust & Azadi, 2010). However, since the correlation strength observed in this study was only at a weak to moderate level, Control should be understood as an important protective factor rather than the only determinant of emotional health.

Cross-Cultural Differences between Chinese and Malaysian Athletes

This study found significant cross-cultural differences between Chinese and Malaysian university basketball athletes in the dimensions of mental toughness and the DASS variables. Specifically, Malaysian athletes scored higher in Challenge and Confidence, while Chinese athletes scored higher in Commitment and Control. In addition, Malaysian athletes also showed higher median scores in Stress, Anxiety, and Depression than Chinese athletes. These results suggest that the psychological resource structure and emotional distress levels of university basketball athletes in the two countries are not completely the same.

These differences may reflect differences between the two countries in coaching practice, training structure, educational demands, and the broader athlete development environment (Kassim & Boardley, 2018). For example, the higher Commitment and Control scores of Chinese athletes may be related to an environment that places more emphasis on discipline, continuous involvement, and training norms, while the higher Challenge and Confidence scores of Malaysian athletes may reflect different training experiences, self-evaluation styles, or competition adaptation patterns (Ong & Harwood, 2017). At the same time, the higher DASS scores in the Malaysian sample also suggest that the expression of negative emotional states may also be influenced by cultural background and differences in the university sport environment (Gorczynski et al., 2020).

The findings further suggest that mental toughness may not be expressed in exactly the same way across different cultural backgrounds (Eubank et al., 2017; Yasuda, 2022). This means that conclusions developed from a single cultural context should not be applied directly when interpreting the psychological characteristics of university basketball athletes. From an applied perspective, this highlights the need to provide culturally sensitive psychological support rather than using one unified athlete development model. For Chinese athletes, psychological support may be more suitable if it builds further confidence and challenge-coping ability on the basis of their existing strengths in commitment and control. For Malaysian athletes, it may be more necessary to strengthen emotional regulation and stress management while maintaining their strengths in challenge and confidence.

Instability of the Country-Specific Correlation Results and Possible Explanations

The country-specific analyses showed that the relationship between mental toughness and DASS was not as stable as that observed in the total sample. Although Control was significantly negatively correlated with stress, anxiety, and depression in the total sample, this relationship became weaker or was no longer significant after the analysis was conducted separately by country. This inconsistency may be related to several factors. First, the sample size of each subgroup was relatively limited after grouping, which may have reduced the statistical power of the correlation analysis and affected the detection of smaller effect relationships (Peterson & Foley, 2021). Second, the range of within-group variation may have become narrower after the country-specific analysis, making the relationships that could be observed in the total sample less likely to appear in the sub-samples (Miciak et al., 2016). In addition, differences between the China and Malaysia samples in training background, university sport environment, and psychological experience may also affect the way the relationship between mental toughness and emotional distress is expressed (Mao, 2025). Therefore, these results suggest that the relationship between mental toughness and emotional distress may be more complex than a simple direct correlation, and it should be interpreted with particular caution in cross-cultural samples.

The findings of this study have practical implications for university basketball training and psychological support. First, because stress, anxiety, and depression were closely related to each other, psychological monitoring should pay attention to athletes' overall emotional state rather than only one single symptom. Second, mental toughness training may place more focus on specific dimensions, especially sense of control. Third, the differences between Chinese and Malaysian athletes suggest that psychological support should be adjusted according to specific cultural and training backgrounds. Finally, further exploration is needed on feasible ways to integrate psychological skills training into regular basketball training.

Conclusion

In conclusion, this study found significant differences between Chinese and Malaysian university basketball players in mental toughness dimensions and DASS variables. Among the mental toughness dimensions, only Control showed a significant negative relationship with Stress, Anxiety, and Depression in the total sample, suggesting that it may be an important protective factor for emotional well-being. In addition, Stress, Anxiety, and Depression were strongly interrelated across the total, China, and Malaysia samples. Overall, the findings highlight the potential importance of Control in student-athletes' psychological health and support the need for culturally sensitive psychological support in university basketball settings.

Limitations of the Study

This study has two main limitations. First, in the country-specific correlation analyses, the sample size of each sub-sample was relatively limited, with only 66 participants in each national group. This may have reduced the statistical power and affected the detection of smaller effect relationships. Second, this study used a cross-sectional design. Therefore, the relationship between mental toughness and psychological distress can only be interpreted as correlational and cannot be used to make causal inferences.

Future Research Directions

Future studies should include larger and more diverse samples from multiple universities in China and Malaysia in order to further verify the stability of the findings of this study. In addition, longitudinal or intervention-based research designs should be used to clarify whether changes in mental toughness are related to changes in stress, anxiety, and depression over time. Future research may also include other relevant factors, such as training load, sleep, recovery, and academic pressure, to better explain the group-specific patterns observed in this study.

References

Afifah, F. T. N., Komarudin, Saputra, M. Y., & Novian, G. (2025, 2025-07-15). Psychological Distress and Anxiety: A Case Study on Student-Athletes at University. *Journal of Physical Education Health and Sport*. https://doi.org/10.15294/jpehs.v12i1.28277

Aizava, P. V. S., Codonhato, R., & Fiorese, L. (2023, 2023-07-21). Association of self-efficacy and mental toughness with sport performance in Brazilian futsal athletes. *Frontiers in Psychology, 14*. https://doi.org/10.3389/fpsyg.2023.1195721

Bell, R., & Riol, C. F. (2017, 2017-05-17). The impact of cross-cultural communication on collective efficacy in NCAA basketball teams. *International Journal of Cross Cultural Management, 17*, 175-195. https://doi.org/10.1177/1470595817702678

Chmiel, J., & Buryta, R. (2025). The Effect of Transcranial Direct Current Stimulation on Basketball Performance—A Scoping Review. *Journal of Clinical Medicine, 14*(10), 3354.

Clough, P., Earle, K., & Sewell, D. (2002). Mental toughness: The concept and its measurement. *Solutions in sport psychology, 1*(1), 32-46.

Crawford, A., Tripp, D., Gierc, M., & Scott, S. (2021, 2021-07-12). The influence of mental toughness and self-regulation on post-season perceptions in varsity athletes. *Journal of American College Health, 71*, 1036-1044. https://doi.org/10.1080/07448481.2021.1920596

Crawford, J., & Henry, J. (2003, 2003-06-01). The Depression Anxiety Stress Scales (DASS): normative data and latent structure in a large non-clinical sample. *The British journal of clinical psychology, 42 Pt 2*, 111-131. https://doi.org/10.1348/014466503321903544

Crust, L., & Azadi, K. (2010, 2010-01-01). Mental toughness and athletes' use of psychological strategies. *European Journal of Sport Science, 10*, 43-51. https://doi.org/10.1080/17461390903049972

Dagnall, N., Denovan, A., Papageorgiou, K., Clough, P., Parker, A., & Drinkwater, K. (2019, 2019-08-21). Psychometric Assessment of Shortened Mental Toughness Questionnaires (MTQ): Factor Structure of the MTQ-18 and the MTQ-10. *Frontiers in Psychology, 10*. https://doi.org/10.3389/fpsyg.2019.01933

Dagnall, N., Drinkwater, K., Denovan, A., & Walsh, R. (2021, 2021-09-24). The Potential Benefits of Non-skills Training (Mental Toughness) for Elite Athletes: Coping With the Negative Psychological Effects of the COVID-19 Pandemic. *Frontiers in Sports and Active Living, 3*. https://doi.org/10.3389/fspor.2021.581431

Denul, A., Pourtois, G., Loeys, T., & Notebaert, W. (2025, 2025-05-23). Social post-error adaptations across four NBA basketball seasons. *Scientific Reports, 15*. https://doi.org/10.1038/s41598-025-02006-x

Drew, B., & Matthews, J. (2019, 2019-04-25). The Prevalence of Depressive and Anxiety Symptoms in Student-Athletes and the Relationship With Resilience and Help-Seeking Behavior. *Journal of Clinical Sport Psychology*. https://doi.org/10.1123/jcsp.2017-0043

Eubank, Nesti, & Littlewood, M. (2017, 2017-05-01). A Culturally Informed Approach to Mental Toughness Development in High Performance Sport. https://doi.org/10.7352/ijsp.2017.48.206

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009, 2009/11/01). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007, 2007/05/01). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191. https://doi.org/10.3758/BF03193146

Gorczynski, P., Currie, A., Gibson, K., Gouttebarge, V., Hainline, B., Castaldelli-Maia, J., Mountjoy, M., Purcell, R., Reardon, C., Rice, S., & Swartz, L. (2020, 2020-02-06). Developing mental health literacy and cultural competence in elite sport. *Journal of Applied Sport Psychology, 33*, 387-401. https://doi.org/10.1080/10413200.2020.1720045

Guo, Z., & Wang, Q. (2025, 2025-08-13). The impact of time pressure on decision-making and visual search characteristics in basketball players. *Frontiers in Psychology, 16*. https://doi.org/10.3389/fpsyg.2025.1660732

Hart, K., Madrigal, L., Ede, A., & Fogaça, J. (2024, 2024-06-11). Examining classroom learning behaviors academic and athletic motivation in collegiate athletes. *Journal of Intercollegiate Sport*. https://doi.org/10.17161/jis.v17i2.21308

Jones, G., Hanton, S., & Connaughton, D. (2007, 01 Jun. 2007). A Framework of Mental Toughness in the World's Best Performers. *The Sport Psychologist, 21*(2), 243-264. https://doi.org/10.1123/tsp.21.2.243

Joseph, P., & Pennington, C. (2025, 2025-08-14). Mental health challenges and interventions among collegiate athletes: A thematic literature review (2010–2025). *Journal of Sports and Physical Activity*. https://doi.org/10.64268/jospa.v1i2.6

Kassim, A., & Boardley, I. (2018, 2018-09-01). Athlete Perceptions of Coaching Effectiveness and Athlete-Level Outcomes in Team and Individual Sports: A Cross-Cultural Investigation. *The Sport Psychologist*. https://doi.org/10.1123/tsp.2016-0159

Lovibond, S. H. (1995). Manual for the depression anxiety stress scales. *Sydney psychology foundation*.

Malhotra, N., & Kaur, R. (2017, 2017-03-21). Mental Toughness in Relation with Mental Health of Sports Persons. *American Journal of Sports Science and Medicine, 5*, 31. https://doi.org/10.11648/j.ajss.20170505.12

Mao, Z. (2025, 2025-10-08). Advancements in research on psychological and emotional aspects of student-athletes. *Frontiers in Psychology, 16*. https://doi.org/10.3389/fpsyg.2025.1645177

Miciak, J., Taylor, W., Stuebing, K., Fletcher, J., & Vaughn, S. (2016, 2016-05-16). Designing Intervention Studies: Selected Populations, Range Restrictions, and Statistical Power. *Journal of Research on Educational Effectiveness, 9*, 556-569. https://doi.org/10.1080/19345747.2015.1086916

Ong, N., & Harwood, C. (2017, 2017-07-27). Attitudes Toward Sport Psychology Consulting in Athletes: Understanding the Role of Culture and Personality. *Sport, Exercise, and Performance Psychology, 7*, 46. https://doi.org/10.1037/spy0000103

Osman, A., Wong, J., Bagge, C., Freedenthal, S., Gutierrez, P., & Lozano, G. (2012, 2012-12-01). The Depression Anxiety Stress Scales-21 (DASS-21): further examination of

dimensions, scale reliability, and correlates. *Journal of clinical psychology, 68 12*, 1322-1338. https://doi.org/10.1002/jclp.21908

Pachaiappan, R. S. P., Veeraswamy, V. B., Mahalingam, K., Gurusamy, G., & Parthiban, B. (2025, 2025-09-25). Mental toughness and athletic performance: a narrative review. *Journal of Basic and Clinical Physiology and Pharmacology, 0*. https://doi.org/10.1515/jbcpp-2025-0091

Parker, P., Perry, R., Coffee, P., Chipperfield, J., Hamm, J., Daniels, L., & Dryden, R. (2021, 2021-09-01). The impact of student-athlete social identity on psychosocial adjustment during a challenging educational transition. *Psychology of Sport and Exercise, 56*, 101979. https://doi.org/10.1016/j.psychsport.2021.101979

Peterson, S., & Foley, S. (2021, 2021-05-06). Clinician's guide to understanding effect size, α level, power, and sample size. *Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition*. https://doi.org/10.1002/ncp.10674

Pocius, E., & Malinauskas, R. (2024, 2024-06-28). Characteristics of mental toughness in young basketball players of different age groups. *Human Movement*. https://doi.org/10.5114/hm/188585

Poulus, D., Coulter, T., Trotter, M., & Polman, R. (2020, 2020-04-23). Stress and Coping in Esports and the Influence of Mental Toughness. *Frontiers in Psychology, 11*. https://doi.org/10.3389/fpsyg.2020.00628

Santos, M. L. D., Uftring, M., Stahl, C., Lockie, R., Alvar, B., Mann, J., & Dawes, J. (2020, 2020-05-01). Stress in Academic and Athletic Performance in Collegiate Athletes: A Narrative Review of Sources and Monitoring Strategies. *Frontiers in Sports and Active Living, 2*. https://doi.org/10.3389/fspor.2020.00042

Sullivan, P., Blacker, M., Murphy, J., & Cairney, J. (2019, 2019-04-21). Levels of Psychological Distress of Canadian University Student-Athletes. *Canadian Journal of Higher Education*. https://doi.org/10.7202/1060823ar

Yasuda, Y. (2022, 2022-01-01). The Potential of Cultural Psychology in Sports Settings. *International Journal of Sport and Health Science*. https://doi.org/10.5432/ijshs.202123