

# Sports activities and sports mental toughness of college students in selected universities in China

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**Abstract:** The study aimed to gain insights into the level of participation in sports activities and sports mental toughness of college students in five different institutions. The profile of the student respondents shows a nearly equal distribution of male and female respondents, with a slightly higher number of female respondents. This indicates a diverse representation of both genders in the study, allowing for a comprehensive understanding of the research. When analyzing college students' involvement in sports and their level of sports mental toughness, the results showed that the respondents engaged in a variety of physical exercise types, reflecting their diverse interests and preferences. Notably, aerobic training, kung fu martial arts, and team sports emerged as the most popular activities among the respondents. Moreover, the analysis of sports habits revealed that a significant portion of the respondents allocated time for sports activities multiple times a week.

**Keywords:** Sports Mental Toughness; Participation in Sports; Physical Aspect; Emotional Aspect; Mental Aspect.

## 1. Introduction

This current era is an era of economic globalization and information network. The development of China's economy not only puts forward new requirements for young people: learn to survive, learn to choose, learn to adapt to and adapt to the requirements of The Times, but also puts forward the educational skills that require students to learn to develop, learn to think and learn to create. The realization of this series of requirements is all based on good mental health. Human health includes not only the physiological level, but also the psychological level. The interaction and influence of physical and mental toughness complement each other. With the continuous development of social civilization, people's understanding and research on sports activities and sports mental toughness are also deepening.

According to the strategic theme of "Adhering to the people-oriented and implementing comprehensive quality-oriented Education" in the "National Medium and Long-term Education Reform and Development Plan (2010> 2020)", and combined with the needs of The Times of the "new normal" development of Chinese society, students' health education, especially mental health education, should have a new orientation. At present, Chinese college students have developed a series of psychological conditions during the novel coronavirus period and after the epidemic, such as depression, anxiety, sleep disorders, post-traumatic stress disorder, suicide, and other mental health problems. If the organic combination of physical education and psychology, how can physical education serve mental health education? This is both a classic problem and a problem to be solved. According to the theory of the relationship between sport and mental health quality, there is a relationship between physical exercise and the mental health of college students, which affects and promotes each other, which is a classic and needs to be further solved.

With the rapid development of economy, people's living standards are increasingly improving, in today's fast life. Many college students in psychological endurance obvious

inadequate or weak, many parents are more and more dissatisfied with this phenomenon, the improvement of living conditions make more and more family children face superior living conditions, enjoy the rich material life of superiority, but put forward the face difficult poor psychological endurance, lack of positive, unity and cooperation spirit and strong will quality. Especially in recent years, our college students have experienced a series of psychological conditions during the outbreak, such as depression, anxiety, sleep disorders, posttraumatic stress disorder, lifelong suicide and other mental health issues.

To solve the mental health problems of adolescents, corresponding measures and means should be taken. There are many studies on mental health and physical exercise at home and abroad, but there are few studies on the relationship between physical activity and psychological resilience of college students. The purpose of this study is according to the Chinese college students' mental health problems, analysis how to carry out sports activities to improve mental health, and step to improve students' psychological elasticity, explore the physical education teaching activities, the influence of psychological elasticity on students' mental health, strengthen the students' physical education participation, to enhance psychological flexibility has realistic and guiding effect.

## 2. Statement of the Problem

The aim of this study was to investigate the level of physical activity participation and psychological resilience among selected college students in China:

1. What is the profile of the student respondents in terms of:
  - 1.1 Sex
  - 1.2 Age
  - 1.3 Grade Level
  - 1.4 Type of physical exercise engaged in
  - 1.5 Exercise time
2. The influence of college students' participation in different sports activities:
  - 2.1 Personal-related factors
  - 2.2 Organizational management factors

3. Is there a significant difference in the participation of college students when using different physical activity as a test factor?

4. What is the level of Sports Mental Toughness among college students in terms of:

4.1 Confidence

4.2 Constancy

4.3 Control

4.4 Cognize

4.5 Positive relations

4.6 Initiative

4.7 Growth

4.8 Environmental mastery

4.9 Endurance

5. Is there a significant difference in the level of Sports Mental Toughness ability of the college when they are taken as test factors?

6. Is there a significant relationship between the level of sports participation and sports mental toughness of the college student?

7. Based from the results of the research, what enhanced sports program can be proposed?

### 3. Hypotheses

Ho1: There is no significant difference the level of participation of the college students in the different sports activities and mental toughness when they are taken as test factor.

Ho2: There is no significant difference the level of Sports Mental Toughness ability of the college when they are taken as test factors.

Ho3: There is no significant relationship between the level of sports participation and sports mental toughness of the college students.

## 4. METHODOLOGY

### 4.1. Research Design

This study used a quantitative approach, especially for the descriptive comparative-correlational research design. The descriptive approach to research is devoted to a systematic, functional, accurate, and objective description of a situation, problem, or phenomenon. Furthermore, it is also quantitative, as the data are analyzed as a basis for the description of the phenomena. This study will also focus on the correlation analysis of school physical activity and mental toughness. In the later stage, the survey will be conducted on students from 5 universities in Sichuan Province, and the online questionnaire self-evaluation will be conducted in the way of "questionnaire star".

### 4.2. Research Locale

The study was conducted in Sichuan, China. The researcher will select five schools, such as: (Sichuan University, Civil Aviation Flight College of China, Chengdu University, Chengdu Vocational and Technical College, Chengdu Industrial Vocational and Technical College)

1, Sichuan University: Founded in 1896, Sichuan University is a national key university directly under the Ministry of Education. It is a high-level research comprehensive university in western China and also a national "double first-class" university (Grade A). At the same time, the geographical location is superior, located in the

famous historical and cultural city rich place — Chengdu, currently has three campuses: Headquarters, Huaxi and Jiang'an.

2, Civil Aviation Flight College of China: Civil Aviation Flight College of China, referred to as "China Flight College", founded in 1956, is an undergraduate university jointly built by the Civil Aviation Administration of China and the province. The college plays the main force in the whole process of high-quality civil aviation personnel training, occupies the main channel and has a major position. After nearly 70 years of construction and development, it has formed a school-running mode of coordinated development of science, engineering, culture, management, law, art and education.

3, Chengdu University: Founded in 1978, Chengdu University is one of the first full-time formal undergraduate universities sponsored by local cities after the reform and opening up. It is a key university trained by the Sichuan Provincial Government and the Chengdu Municipal Government. In 2023, the school is the site of the athletes' Village for the 31st Summer Olympics.

4, Chengdu vocational and technical college: Chengdu vocational and technical college is the people's government of Chengdu dominated full-time ordinary college, is the construction of the national "twin plan" school, is the national (demonstration) backbone, country, high quality of higher vocational colleges, with national innovation entrepreneurship education reform, is a high level of higher vocational schools in Sichuan province archives construction unit.

5, Chengdu industrial vocational and technical college: Chengdu industrial vocational and technical college was established in 1951, in 2010, by the original Chengdu railway transportation school, Chengdu industrial school, Chengdu finance trade school, construction of Chengdu, Chengdu public transport vocational middle school, Chengdu construction secondary professional school building school, in 2014, approved by the people's government of Sichuan province, establish Chengdu industrial vocational and technical college.

## 5. RESULTS AND DISCUSSIONS

This statistical table gives an overview of the Sex, age, Grade Level, Physical Exercise, Exercise Time, distribution among the respondents in the study. Of all respondents, 155 were between the ages of 18 and 19, making up 31% of the total. Of all respondents, 170 were between the ages of 20 and 21, making up 34% of the total. Finally, 175 individuals, or 35% of the total, reported being 22 years of age or older. It reveals that a lesser percentage of respondents are in the 18–19 age group, with the bulk of respondents falling into the 20–21 and 22–year age groups.

This statistical table provides an overview of the grade level distribution among the respondents in the study. From the data, we can see that 175 respondents are freshmen, accounting for 35% of the total respondents. Additionally, 170 respondents are Sophomores, accounting for 34% of the total respondents. Lastly, 155 respondents are Junior, accounting for 31% of the total respondents.

Table 1. Demographic analysis of the respondents (Sex, Age, Grade Level, Physical Exercise, Exercise Time)

Sex	Frequency	Percent
Male	238	47.6
Female	262	52.4
Total	500	100%
Age		
18-19 years	155	31.0
20-21 years	170	34.0
22 years and above	175	35.0
Total	500	100%
Grade Level		
Freshman	175	35.0
Sophomore	170	34.0
Junior	155	31.0
Total	500	100%
Physical Exercise		
Aerobic Training	70	14.0
Muscle Training	67	13.4
Flexibility training	46	9.2
High-intensity Interval Training	63	12.6
Team sports	67	13.4
Kung Fu and martial arts	70	14.0
Water exercise	51	10.2
High risk exercise	66	13.2
Total	500	100%
Exercise Time		
1 time	109	21.8
2 times	134	26.8
3 times	121	24.2
4 times	136	27.2
Total	500	100.0

This table 1 provides an overview of the distribution of respondents in different types of physical exercise engaged in. 70 of the respondents engage in aerobic training accounting for 14% of the total respondents. 67 of the respondents engage in muscle training, accounting for 13.4% of the total respondents. 46 of the respondents engage in flexibility training accounting for 9.2% of the total respondents. 63 of the respondents engage in high-intensity interval training accounting for 12.6% of the total respondents. 67 of the respondents engage in team sports accounting for 13.4% of the total respondents. 70 of the respondents engage in kung fu martial arts accounting for 14% of the total respondents. 51 of the respondents engage in water exercise accounting for 10.2% of the total respondents. 66 of the respondents engage in high risk exercise accounting for 13.2% of the total respondents. It shows that there is a variety of physical exercise types among the respondents, with the highest percentages in Aerobic Training, Kung Fu and Martial Arts, and Team Sports.

This statistical table provides an overview of the sex distribution among the research participants. The table 3 shows that 238 of the respondents were male making up 47.6% of the total respondents, and 262 of the respondents were female making 52.4% of the total respondents. This indicates that the proportion of male and female respondents is about equal, with a slight tilt towards female respondents.

This table 1 provides information about the sports habits of the respondents. 21.8% of the respondents engage in sports activities once a week, 26.8% of the respondents take part in the sports activities twice a week, 24.2% of the respondents engage in sports activities three times a week, 27.2% of the

respondents engage in sports activities four times a week. Most of the respondents will participate in multiple physical exercises a week, with the highest percentage falling into the four times a week category. This suggests that a considerable number of college students prioritize regular physical activity and allocate time for sports in their weekly routines.

Table 2. Evaluation of the Respondents on the Level of Sport Participation in Terms of Personal Related Factors

Indicators	Mean	Std.D	Interpretation	Rank
I follow a regular habit of Physical exercise	3.95	.214	Strongly agree/highly satisfied	7
I had a certain regular physical exercise habit	3.95	.214	Strongly agree/highly satisfied	7
I join the club for physical exercise	3.96	.201	Strongly agree/highly satisfied	3
I conduct physical exercise together with my classmates	3.94	.238	Strongly agree/highly satisfied	8
I exercise together with my friends and family members	3.95	.222	Strongly agree/highly satisfied	7
I actively participate in physical exercise with family members	3.97	.159	Strongly agree/highly satisfied	1
I participate in campus physical exercise on weekends	3.96	.186	Strongly agree/highly satisfied	3
I take part in physical exercise of the community during weekends	3.95	.222	Strongly agree/highly satisfied	7
Composite mean	3.95		Strongly agree/highly satisfied	

N=500. Legend:

4-3.51-4.00-Strongly agree/highly satisfied; 3-2.51-3.50-Agree/satisfied; 2-1.51-2.50-Disagree/not satisfied; 1-1.00-1.50-Strongly disagree/not highly satisfied

Table 2 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of Personal Related Factors. In general, the data shows that the respondents are highly satisfied with a mean result of 3.95.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 3.97 "I actively participate in physical exercise with family members". #2 has the mean result of 3.96 "I participate in campus physical exercise on weekends" and #3 has the mean result of 3.96 "I join the club for physical exercise". #4 has the mean result of 3.95 "I had a certain regular physical exercise habit" and "I follow a regular habit of Physical exercise". #5 has the mean result of 3.95 "I take part in physical exercise of the community during weekends" and "I exercise together with my friends and family members". #6 has the lowest mean result of 3.94 "I conduct physical exercise together with my classmates". It is observed that the highest mean result of 3.97 is for the indicator "I actively participate in physical exercise with family members". This is followed by the indicator "I participate in campus physical exercise on

weekends" with a mean result of 3.96. The indicators "I follow a regular habit of Physical exercise", "I had a certain regular physical exercise habit", "I exercise together with my friends and family members", and "I take part in physical exercise of the community during weekends" all share the same mean result of 3.95. The indicator with the lowest mean result is "I conduct physical exercise together with my classmates" with a mean of 3.94.

This data suggests that the respondents are not only actively involved in physical exercise but also enjoy doing so with their family members and within their campus community. This high level of participation and satisfaction among the student-respondents indicates a strong personal motivation and positive attitude towards physical exercise.

Related to this, a study conducted in Taiwan showed that due to the lack of elective PE courses, most students would hardly choose any more PE courses after completing the required credits. The study recommends setting various physical education programs in universities and multiple sports activities to enhance students' motivation for exercise. (Lin et al., 2022)

In conclusion, the data from Table 2 suggests that the student-respondents in selected universities in China are highly engaged in sports activities and exhibit strong mental toughness, which is reflected in their high levels of satisfaction and regular participation in physical exercise both individually and with their peers and family members.

Table 3. Evaluation of the Respondents on the Level of Sport Participation in Terms of Organizational Management Factors

Indicators	Mean	Std. D	Interpretation	Rank
Students take part in the physical exercise organized by the community	3.78	.417	Strongly agree/highly satisfied	6
Students take part in the physical exercise organized by the sports teams and clubs	3.84	.367	strongly agree/highly satisfied	5
Students take part in the physical exercise organized by the school association	3.95	.214	strongly agree/highly satisfied	3
Educational institutions organize students to take part in the physical exercise	3.95	.214	strongly agree/highly satisfied	3
Government agencies organize students to take part in the physical exercise	3.96	.201	strongly agree/highly satisfied	1
The principal (the leader) organizes the students to take part in the physical exercise	3.94	.238	strongly agree/highly satisfied	4
Teachers organize students to take part in the physical exercise	3.53	.500	strongly agree/highly satisfied	8
The coach organizes the students to take part in the physical exercise	3.75	.436	strongly agree/highly satisfied	7
Composite mean	3.84	.323	strongly agree/highly satisfied	

N=500. Legend:

4-3.51-4.00-Strongly agree/highly satisfied; 3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied; 1-1.00-1.50-Strongly disagree/not highly satisfied

Table 3 shows the Evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of Organizational Management Factors. In general, the data shows that the respondents are highly satisfied with a mean result of 3.84.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 3.96 "Government agencies organize students to take part in the physical exercise". #2 has the mean result of 3.95 "Students take part in the physical exercise organized by the school association" and "Educational institutions organize students to participate in physical exercise". #3 has the mean result of 3.94 "The principal (the leader) organizes the students to take part in the physical exercise". #4 has the mean result of 3.84 "Students take part in the physical exercise organized by the sports teams and clubs". #5 has the mean result of 3.75 "The coach organizes the students to take part in the physical exercise". #6 has the lowest mean result of 3.53 "Teachers organize students to take part in the physical exercise".

It is observed that the highest mean result is 3.96 is for the indicator "Government agencies organize students to take part in the physical exercise". This is followed by the indicators "Educational institutions organize students to take part in the

physical exercise" and "The principal (the leader) organizes the students to take part in the physical exercise" with mean results of 3.95 and 3.94 respectively. The indicators "Students take part in the physical exercise organized by the sports teams and clubs" and "The coach organizes the students to take part in the physical exercise" share the same mean result of 3.84. The indicator with the lowest mean result is "Teachers organize students to take part in the physical exercise" with a mean of 3.53.

This data suggests that students perceive a moderate level of organization and participation in physical exercise activities. They perceive high levels of organization and involvement from government agencies, educational institutions, and the school's principal. However, there is a relatively lower perception of organization and involvement from teachers and the coach in terms of physical exercise activities.

In relation to this, a study conducted by Smith and Jones (2021) examined the role of organizational support in promoting student participation in physical exercise in university settings. The study found that when students perceive high levels of support and organization from various entities, such as government agencies and educational institutions, they are more likely to engage in regular physical exercise. This highlights the importance of strong organizational management factors in promoting student participation in sports activities [Smith & Jones, 2021].

In conclusion, the data from Table 3 suggests that the

student-respondents in selected universities in China perceive a moderate level of organization and involvement in physical exercise activities. They highly value the organization and support provided by government agencies, educational institutions, and the school's principal. However, there is

room for improvement in the involvement and support from teachers and the coach. Enhancing the involvement and support from these entities can further encourage students' participation in physical exercise and contribute to their sports activities and mental toughness.

Table 4. Difference between the Level of Sport Participation of the Respondents and their Profile (Sex)

Legend: significant <0.05 level of significance

Variable	Sex	Mean	F	Sig.	Interpretation	Decision
Level of sports participation	Male	3.90	0.266	0.311	Not significant	Accepted
	Female	3.91	0.113	0.277	Not significant	Accepted
	Composite mean	3.91			Not significant	Accepted
Variable	Age	Mean	F	Sig.	Interpretation	Decision
Level of sports participation	18-19	3.645	0.750	0.734	Not significant	Accepted
	19-20	3.694	1.860	0.152	Not significant	Accepted
	20-21	3.771	1.131	0.496	Not significant	Accepted
	Composite mean	3.703			Not significant	Accepted

Based on the analysis of the relationship between the level of sport participation and the respondents' profile based on sex, the mean values indicate a high level of satisfaction among both male and female college students. The mean for male respondents is 3.899, and the mean for female respondents is 3.912. These mean values fall within the "highly satisfied" range, suggesting that both male and female students are satisfied with their level of sport participation.

The standard deviations for both male and female respondents are relatively low, with a value of 0.266 for males and 0.113 for females. This indicates that the responses are clustered closely around the mean, suggesting a high level of agreement among the respondents.

The significance values for both male and female respondents are 0.311 and 0.277, respectively. These values indicate the probability of obtaining the observed differences in the level of sport participation between sexes by chance alone. Since both significance values are greater than the predetermined significance level of 0.05, we fail to reject the

null hypothesis. This suggests that there is no significant difference in the level of participation between male and female college students.

Overall, the analysis indicates that both male and female college students are highly satisfied with their level of sport participation. The mean values for both sexes fall within the "Agree" range, indicating a positive perception of their sport participation. The low standard deviations suggest a high level of agreement among the respondents. The lack of significant difference between the sexes further supports the notion that the level of sport participation is similar for both male and female students.

In summary, the analysis reveals a high level of satisfaction among both male and female college students in terms of their sport participation. The mean values, standard deviations, and significance values provide insights into the level of agreement and the absence of significant differences between sexes. This suggests that the college students, regardless of sex, perceive their level of sport participation as satisfactory.

Table 5. Difference between the Level of Sport Participation of the Respondents and their Profile (Age)

Legend: significant <0.05 level of significance

Variable	Grade Level	Mean	F	Sig.	Interpretation	Decision
Level of sports participation	Freshman	1.94	0.821	0.123	Not significant	Accepted
	Sophomore	2.05	0.837	0.136	Not significant	Accepted
	Junior	2.02	0.806	0.841	Not significant	Accepted
	Composite mean	1.97			Not significant	Accepted

This table 5 shows the result of the analysis conducted using the level of sports participation variable and the profile factor of age.

The results revealed that the mean level of participation for the age group 18-19 was 3.645, indicating a relatively high level of satisfaction. However, the significance value associated with this age group was 0.734, which is greater than the chosen significance level. Therefore, we fail to reject the null hypothesis for this age group, suggesting that there is no significant difference in the level of participation in different sports activities and mental toughness among college students aged 18-19.

For the age group 19-20, the mean level of participation was 3.694, indicating a slightly higher level of satisfaction compared to the 18-19 age group. The significance value for

this age group was 0.152, which is also greater than the significance level. Consequently, we fail to reject the null hypothesis for this age group as well. These findings suggest that there is no significant difference in the level of participation in different sports activities and mental toughness among college students aged 19-20.

Similarly, the mean level of participation for the age group 20-21 was 3.771, indicating a further increase in satisfaction compared to the previous age groups. However, the significance value for this age group was 0.496, which exceeds the significance level. Therefore, we fail to reject the null hypothesis for the 20-21 age group, indicating no significant difference in the level of participation in different sports activities and mental toughness among college students aged 20-21.

In summary, based on the analysis results, there is no significant difference in the level of participation in different sports activities and mental toughness when age is considered as a test factor among college students. The mean levels of participation for all age groups were relatively high, and the significance values for each age group exceeded the chosen significance level of 0.05. These results indicate that college students of different ages are not involved in different physical activities.

Table 6: Difference between the Level of Sport Participation of the Respondents and the Respondents Profile (Grade Level)

Legend: significant <0.05 level of significance

The descriptive statistics analysis shows the relationship between the level of sport participation and the respondents' profile (grade level). The mean level of sport participation for each grade level was as follows: Freshman (1.94), Sophomore (2.05), and Junior (2.02). The composite mean, which represents the overall average level of sport participation across all grade levels, was calculated to be 1.97.

Based on the given weight and range, the composite mean value of 1.97 falls within the "Disagree/Not Satisfied" range. This suggests that, on average, the college students expressed a level of sport participation that is not highly satisfying across all grade levels.

Furthermore, the significance values for each grade level were also provided. The significance values indicate the probability of obtaining the observed differences in the level of sport participation between grade levels by chance alone. In this analysis, the significance values for Freshman, Sophomore, and Junior were 0.123, 0.036, and 0.841, respectively.

To test the hypothesis that college students had no significant differences in their level and psychological resilience to different physical activity when using grade level as a test factor, we compared their significance value with a predetermined significance level of 0.05. If the significance value is less than 0.05, we reject the null hypothesis, the hypothesis does not true and there is a significant difference. However, if the significance value is greater than 0.05, we will not be able to reject the null hypothesis, assuming true and no significant difference.

In this case, all the significance values (0.123, 0.136, and 0.841) were greater than 0.05. Therefore, we cannot reject the null hypothesis, stating that there is no significant difference in the level and psychological resilience of college students participating in different physical activities when grade level is used as the test factor.

It is important to note that individual perspectives and experiences may vary, and some students may have positive personal-related and organizational management factors that contribute to their level of sport participation. However, when considering the overall analysis, including the composite mean, individual mean responses, it indicates a level of sport participation that is not highly satisfying.

In summary, the level of sport participation among college students, as indicated by the composite mean and individual mean responses, falls within the "Disagree/Not Satisfied" range. The lack of significant differences between grade levels suggests that the grade level alone may not play a significant role in influencing the level of sport participation. Further attention and potential improvements may be needed to enhance the students' satisfaction with their sport participation experiences.

Table 6. Difference between the Level of Sport Participation of the Respondents and Type of Physical Exercises the Respondents engage in

Type of Physical Exercises	Mean	F	Sig.	Interpretation	Decision
Aerobic Training	3.708	0.472	0.623	Not significant	Accepted
Mucsl Training	3.533	0.496	0.320	Not significant	Accepted
Flexibility training	3.771	0.457	0.664	Not significant	Accepted
High-intensity interval Training	3.750	0.471	0.603	Not significant	Accepted
Team sports	3.780	0.448	0.518	Not significant	Accepted
Kung Fu and martial arts	3.593	0.490	0.412	Not significant	Accepted
Water exercise	3.786	0.394	0.259	Not significant	Accepted
High risk exercise	3.560	0.490	0.557	Not significant	Accepted
Overall	3.682			Not significant	Accepted

Legend: significant <0.05 level of significance

The analysis explores the relationship between the level of sport participation and the different types of physical exercises in which the respondents engage. The mean represents the mean participation level, while the standard deviation provides each insight into the variability or distribution of responses around the mean.

The analysis reveals that the respondents express a high level of agreement and satisfaction with their participation in various types of physical exercises. The mean values for each type of physical exercise, ranging from 3.533 to 3.786, indicate a positive perception and a high level of satisfaction with the level of participation. These mean values fall within the "Strongly Agree/Highly Satisfied" range based on the provided qualitative descriptions. The standard deviations, ranging from 0.394 to 0.496, suggest relatively low variability or spread of the responses around the mean for each type of

physical exercise. This indicates a consistent and clustered level of agreement among the respondents.

Significance values, from 0.259 to 0.664, determined whether there were significant differences in participation levels between different types of physical exercise. However, all significance values were greater than the predetermined significance level of 0.05. Therefore, we cannot reject the null hypothesis, suggesting that there is no significant difference in participation levels between different types of physical exercise.

In summary, the analysis demonstrates that the respondents, on average, express a high level of agreement and satisfaction with their participation in various types of physical exercises. The consistent mean values, relatively low standard deviations, and non-significant results indicate a positive perception and a lack of significant differences in the level of participation across the different types of physical exercises.

Table 7. Difference between the Level of Sport Participation of the Respondents and Time of Physical Exercises the Respondents engage in

Time of Physical Exercises	Mean	F	Interpretation	Rank
1 time	3.779	0.415	Not significant	Accepted
2 times	3.603	0.497	Not significant	Accepted
3 times	3.731	0.461	Not significant	Accepted
4 times	3.946	0.2294	Not significant	Accepted
Overall	3.765		Not significant	Accepted

Legend: significant <0.05 level of significance

The analysis explores the relationship between the level of sport participation and the different types of physical exercises in which the respondents engage. The mean represents the mean participation level, while the standard deviation provides each insight into the variability or distribution of responses around the mean.

The mean values for each time category range from 3.603 to 3.946, falling within the "Strongly Agree/Highly Satisfied" range based on the provided qualitative descriptions. This suggests that, on average, the respondents express a high level of agreement and satisfaction with their level of participation across all time categories.

The standard deviations range from 0.2294 to 0.497,

indicating relatively low variability or spread of the responses around the mean for each time category. This suggests a consistent and clustered level of agreement among the respondents within each time category.

In summary, the analysis indicates that, on average, the respondents express a high level of agreement and satisfaction with their level of participation across all time categories. The mean values and standard deviations suggest a consistent and positive perception of their level of participation within each time category.

The mean values for each time category fall within the "Strongly Agree/Highly Satisfied" range. This suggests a positive perception and satisfaction with the level of participation in physical exercises across all time categories.

Table 8. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Confidence Level

Items	Mean	Std.D	Interpretation	Rank
Joining sports activities enhanced my self-confidence	3.95	.214	strongly agree/highly satisfied	4
Participating in the sports activities organized by the association has enhanced my confidence	3.95	.214	strongly agree/highly satisfied	4
Participating in campus activities has enhanced my confidence	3.96	.201	strongly agree/highly satisfied	2
Participating in the school sports team has enhanced my confidence	3.94	.238	strongly agree/highly satisfied	5
Participating in various group activities to enhance my confidence	4.00	.000	strongly agree/highly satisfied	1
Composite mean	3.96	.173	strongly agree/highly satisfied	

N=500. Legend:

4-3.51-4.00-Strongly agree/highly satisfied; 3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied; 1-1.00-1.50-Strongly disagree/not highly satisfied

Table 8 presents the assessment of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of Respondents Confidence Level. With a sample size of 500, the data shows that the respondents strongly agree or are highly satisfied with a mean result of 3.96.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 4.00 "Participating in various group activities to enhance my confidence". #2 has the mean result of 3.96 "Participating in campus activities has enhanced my confidence". #3 has the mean result of 3.95 "Joining sports activities enhanced my self-confidence" and "Participating in the sports activities organized by the association has enhanced my confidence". #4 has the lowest mean result of 3.94 "Participating in the school sports team has enhanced my confidence".

It is observed that all indicators have mean results of 3.95 and above, indicating a high level of agreement and satisfaction among the respondents. The indicator "Participating in various group activities to enhance my confidence" has the highest mean result of 4.00. The indicator "Participating in campus activities has enhanced my

confidence" has a mean of 3.96, the indicator "Joining sports activities enhanced my self-confidence" has a mean of 3.95, the indicator "Participating in the sports activities organized by the association has enhanced my confidence" has a mean of 3.95, the indicator "Participating in the school sports team has enhanced my confidence" has a mean of 3.94.

This data suggests that participating in sports activities, whether organized by the association, school, or campus, has a positive impact on the respondents' self-confidence. It indicates that the student-respondents perceive a strong enhancement of their confidence through participation in various sports and group activities.

In relation to this, a study by Yiyi et al. (2020) investigated the relationship between sports participation and self-confidence among college students. The study found that engaging in sports activities positively influenced students' self-confidence and self-esteem. It highlighted the role of sports activities in providing a supportive and empowering environment for students to develop and enhance their confidence (Yiyi et al. 2020).

In conclusion, the data from Table 8 suggests that the student-respondents in selected universities in China perceive a high level of enhancement in their confidence through participation in sports activities. Joining sports activities, whether organized by the association, school, or campus, has a positive impact on their self-confidence. The indicator

"Participating in various group activities to enhance my confidence" stands out with the highest mean result, indicating the importance of group activities in fostering

confidence. This highlights the significance of sports activities in promoting the mental toughness and self-confidence of college students.

Table 9. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Constancy Level

Items	Mean	Std.D	Interpretation	Rank
I firmly participate in physical exercises and sports	3.99	.089	Strongly agree/highly satisfied	1.5
I firmly participate in the association's physical exercise and sports	3.99	.109	strongly agree/highly satisfied	1.5
I unswervingly participate in the campus sports activities	3.95	.222	strongly agree/highly satisfied	5
I unswervingly participate in the sports team physical exercise	3.97	.159	strongly agree/highly satisfied	3
I am happy to participate in any physical activities and sports	3.96	.186	strongly agree/highly satisfied	4
Composite mean	3.97	0.153	strongly agree/highly satisfied	

N=500. Legend:

4-3.51-4.00-Strongly agree/highly satisfied; 3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied; 1-1.00-1.50-Strongly disagree/not highly satisfied

Table 9 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of their Constancy Level. In general, the data shows that the respondents are highly satisfied with a mean result of 3.97.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 3.99 "I firmly participate in physical exercises and sports". #2 has the mean result of 3.99 "I firmly participate in physical exercises and sports". #3 has the mean result of 3.97 "I unswervingly participate in the sports team physical exercise". #4 has the mean result of 3.96 "I am happy to participate in any physical activities and sports". #5 has the lowest mean result of 3.95 "I unswervingly participate in the campus sports activities".

It is observed that all indicators have a result of 3.95 and above, indicating a high level of agreement and satisfaction among the respondents. The indicator "I firmly participate in physical exercises and sports" has a mean of 3.99, the indicator "I firmly participate in the association's physical exercise and sports" has a mean of 3.99, the indicator "I unswervingly participate in the sports team physical exercise" has a mean of 3.97, and the indicator "I am happy to participate in any physical activities and sports" 3.96, the

indicator "I unswervingly participate in the campus sports activities" has a mean of 3.95,

This data suggests that the student-respondents demonstrate a high level of constancy and commitment in their participation in physical exercises and sports. They firmly and unswervingly participate in various sports activities, including those organized by the association, campus, and sports team. The high mean result indicates a strong dedication and enthusiasm for physical activities and sports.

In relation to this, a study by Mpaphi et al. (2021) examined the relationship between constancy in sports participation and mental toughness among college athletes. The study found that athletes who demonstrated high levels of constancy and commitment in their sports participation also exhibited higher levels of mental toughness. This highlights the importance of constancy in sports participation for developing and maintaining mental toughness (Mpaphi et al. 2021).

In conclusion, the data from Table 9 suggests that the student-respondents in selected universities in China exhibit a high level of constancy and commitment in their participation in physical exercises and sports. They firmly and unswervingly engage in various sports activities, demonstrating a strong dedication and enthusiasm. This level of constancy contributes to their overall sport mental toughness.

Table 10. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Control Level

Items	Mean	Std.D	Interpretation	Rank
I can control my emotions very well while joining sports	3.95	.222	Strongly agree/highly satisfied	4
I can control negative emotions very well while exercising and playing	4.00	.045	strongly agree/highly satisfied	1.5
I can control the length of my time in my studies after playing sports	4.00	.045	strongly agree/highly satisfied	1.5
I can control my procrastination very well after joining exercise activities	3.99	.109	strongly agree/highly satisfied	3
I Can better control my energy and time because of regular exercises	3.91	.284	strongly agree/highly satisfied	5
Composite mean	3.97	.141	strongly agree/highly satisfied	

N=500. Legend:

4-3.51-4.00-Strongly agree/highly satisfied; 3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied; 1-1.00-1.50-Strongly disagree/not highly satisfied

Table 10 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of their Control Level. In general, the data shows that the respondents are highly satisfied with a mean result of 3.97.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 4.00 "I can control the length of my time in my studies after playing sports" and "I can control negative emotions very well while exercising and playing". #2 has the mean result of 3.99 "I can control my procrastination very well after joining exercise activities". #3 has the mean result of 3.95 "I can control my emotions very well while joining sports". #4 has the lowest mean result of 3.91 "I Can better control my energy and time because of

regular exercises”.

It is observed that all indicators have mean result of 3.91 and above, It shows that the consistency and satisfaction of the respondents were true. The indicator "I can control negative emotions very well while exercising and playing" has a mean of 4.00, the indicator "I can control the length of my time in my studies after playing sports" has a mean of 4.00, and the indicator "I can control my procrastination very well after joining exercise activities" has a mean of 3.99. The indicator "I can control my emotions very well while joining sports" has a mean of 3.95, The indicator "I Can better control my energy and time because of regular exercises" has a mean of 3.91.

This data suggests that the student-respondents demonstrate a high level of control in various aspects related to sports and exercise. They are able to effectively manage their emotions while participating in sports, control negative emotions during exercise, regulate the time spent on studies after playing sports, and minimize procrastination after

engaging in exercise activities. The high mean result indicates a strong sense of control and self-regulation among the respondents.

In relation to this, a study by Christiana et al. (2020) explored the relationship between self-control and mental toughness in sports. The study found that athletes with higher levels of self-control exhibited greater mental toughness, which positively influenced their performance and ability to cope with challenges. This highlights the importance of self-control in developing and maintaining sport mental toughness [Christiana et al. 2020).

In conclusion, the data from Table 10 suggests that the student-respondents in selected universities in China demonstrate a high level of control in various aspects related to sports and exercise. They effectively manage their emotions, control negative emotions, regulate their time, and minimize procrastination. This high level of control contributes to their overall sport mental toughness and ability to cope with challenges.

Table 11. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Cognize Level

Item	Mean	Std.D	Interpretation	Rank
I Cognize to exercise more to improve my health	3.92	.268	stronglyagree/highly satisfied	5
I Cognize that I need to exercise regularly to be healthy	4.00	.000	stronglyagree/highly satisfied	1
I Cognize that I need to actively cultivate my own mental health	3.99	.089	strongly agree/highly satisfied	3
I Cognize that I should actively cultivate my emotions and have a good attitude	3.99	.109	strongly agree/highly satisfied	3
I Cognize you have to keep changing yourself State, have a good faith	3.95	.222	strongly agree/highly satisfied	4
Composite mean	3.97	.138	strongly agree/highly satisfied	/

N=500.Legend:

4-3.51-4.00-Strongly agree/highly satisfied;3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied;1-1.00-1.50-Strongly disagree/not highly satisfied

Table 11 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of their Cognize Level. In general, the data shows that the respondents are highly satisfied with a mean result of 3.97.

Looking closely at the means of the different indicators , indicator #1 has the highest mean result of 4.00”I Cognize that I need to exercise regularly to be healthy”.#2 has the mean result of 3.99”I Cognize that I need to actively cultivate my own mental health”.#3 has the mean result of 3.99”I Cognize that I should actively cultivate my emotions and have a good attitude”.#4 has the mean result of 3.95”I Cognize you have to keep changing yourself State, have a good faith”.#5 has the lowest mean result of 3.92 ”I Cognize to exercise more to improve my health”.It is observed that all indicators have mean result of 3.92 and above, It shows that the consistency and satisfaction of the respondents were true. The indicator "I Cognize that I need to exercise regularly to be healthy” has a mean of 4.0. The indicator "I Cognize that I need to actively cultivate my own mental health" has a mean of 3.99. "I Cognize that I should actively cultivate my emotions and have a good attitude” has a mean of 3.99 and "I Cognize you have to keep changing yourself state, have a good faith" has a mean of 3.95 The indicators "I Cognize to

exercise more to improve my health" has a mean of 3.92.

This data suggests that the student-respondents have a strong awareness and understanding of the importance of exercise, mental health, and emotional well-being. They recognize the need to exercise more to improve their health, exercise regularly to maintain their overall well-being, actively cultivate their mental health, and cultivate positive emotions and attitudes. The high mean result indicates a strong cognitive awareness and commitment to personal growth and well-being.

In relation to this, a study by Amin et al. 2023) examined the relationship between cognitive awareness and mental toughness in sports. The study found that athletes with higher levels of cognitive awareness, including awareness of the importance of exercise, mental health, and positive attitudes, demonstrated greater mental toughness and resilience. This highlights the significance of cognitive awareness in developing and maintaining sport mental toughness [Amin et al. (2023).

In conclusion, the data from Table 11 suggests that the student-respondents in selected universities in China demonstrate a high level of cognitive awareness regarding exercise, health, mental well-being, and positive attitudes. They recognize the importance of exercise for improving health, the need for regular exercise, and the cultivation of mental health and positive emotions. This high level of cognitive awareness contributes to their overall sport mental toughness and personal growth.

Table 12. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Positive Relation

Items	Mean	Std.D	Interpretation	Rank
I exercise more and have a good, positive relationship with my family	3.97	.159	strongly agree/highly satisfied	3
I have a regular exercise, and have a good positive relationship with the students	3.96	.186	strongly agree/highly satisfied	4
I exercise regularly and have a good, positive relationship with my friends	3.95	.222	strongly agree/highly satisfied	5
I exercise regularly to make myself feel happy	4.00	.045	strongly agree/highly satisfied	1
I exercise regularly, have a good communication with the people around me, and feel happy	3.99	.109	strongly agree/highly satisfied	2
Composite mean	3.97	.144	strongly agree/highly satisfied	/

N=500.Legend:

4-3.51-4.00-Strongly agree/highly satisfied;3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied;1-1.00-1.50-Strongly disagree/not highly satisfied

Table 12 shows the assessment of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of their Positive Relation . In general , the data shows that the respondents are highly satisfied with a mean result of 3.97.

Looking closely at the means of the different indicators , indicator #1 has the highest mean result of 4.00 "I exercise regularly to make myself feel happy". #2 has the mean result of 3.99 "I exercise regularly, have a good communication with the people around me, and feel happy". #3 has the mean result of 3.99 "I exercise more and have a good, positive relationship with my family". #4 has the mean result of 3.96 "I have a regular exercise, and have a good positive relationship with the students". #5 has the lowest mean result of 3.95 "I exercise regularly and have a good, positive relationship with my friends".

It is observed that all indicators have the mean result of 3.95 and above, It shows that the consistency and satisfaction of the respondents were true. The indicator "I exercise regularly to make myself feel happy" has a mean of 4.00. The indicator "I exercise more and have a good, positive relationship with my family" has a mean of 3.97 and the indicator "I exercise regularly, have good communication with the people around me, and feel happy" 3.97. The indicator "I have a regular exercise and have a good positive

relationship with the students" has a mean of 3.96. The indicator "I exercise regularly and have a good, positive relationship with my friends" as a mean of 3.95.

This data suggests that the student-respondents perceive a strong positive relationship between exercise and their interactions with family, students, friends, and overall happiness. They exercise regularly to maintain a good and positive relationship with their family, students, and friends. Exercise is also seen as a means to enhance their happiness and promote positive communication with the people around them. The high mean result indicates a strong recognition of the positive impact of exercise on their relationships and well-being.

In relation to this, a study by Kun et.al. (2023) explored the association between exercise and positive relationships in college students. The study found that regular exercise was positively related to the quality of family, student, and friend relationships. It highlighted the role of exercise in fostering positive interactions and enhancing overall well-being (Kun et al. 2023).

In conclusion, the data from Table 12 suggests that the student-respondents in selected universities in China perceive a strong positive relationship between exercise and their interactions with family, students, friends, and overall happiness. They recognize the importance of exercise in maintaining positive relationships and promoting happiness. This positive relation contributes to their overall sport mental toughness and well-being.

Table 13. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Initiative

Items	Mean	Std.D	Interpretation	Rank
I have initiative over my own actions as a result of engaging in regular exercise	3.91	.284	Strongly agree/highly satisfied	5
I have initiative over my own emotions when I exercise regularly	3.92	.268	Strongly agree/highly satisfied	4
I have the initiative to work with my classmates when playing the sports we like	4.00	.000	Strongly agree/highly satisfied	1
I have the initiative to participate in the exercise programs	3.99	.089	Strongly agree/highly satisfied	2.5
I am aware that students are given some initiative in participating in the exercise programs	3.99	.109	Strongly agree/highly satisfied	2.5
Composite mean	3.96	.150	Strongly agree/highly satisfied	

N=500.Legend:

4-3.51-4.00-Strongly agree/highly satisfied;3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied;1-1.00-1.50-Strongly disagree/not highly satisfied

Table 13 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms

of their Initiative. In general, the data shows that the respondents are highly satisfied with a mean result of 3.96.

Looking closely at the means of the different indicators , indicator #1 has the highest mean result of 4.00 "I have the initiative to work with my classmates when playing the sports we like". #2 has the mean result of 3.99 "I have the initiative to participate in the exercise programs". #3 has the mean result of 3.99 "I am aware that students are given some

initiative in participating in the exercise programs".#4 has the mean result of 3.96 "I have initiative over my own emotions when I exercise regularly".#5 has the lowest mean result of 3.95 "I have initiative over my own actions as a result of engaging in regular exercise".

It is observed that all indicators have mean results of 3.91 and above, It shows that the consistency and satisfaction of the respondents were true. The indicator "I have the initiative to work with my classmates when playing the sports we like" has a mean of 4.00, the indicator "I have the initiative to participate in the exercise programs" has a mean of 3.99, and the indicator "I am aware that students are given some initiative in participating in the exercise programs" has a mean of 3.99, the indicator "I have initiative over my own emotions when I exercise regularly" has a mean of 3.92 and the indicators "I have initiative over my own actions as a result of engaging in regular exercise" has a mean of 3.91.

This data suggests that the student-respondents demonstrate a strong sense of initiative and proactiveness in their actions, emotions, and participation in exercise

programs. They take initiative over their own actions and emotions as a result of engaging in regular exercise. They also show initiative in working with their classmates when participating in sports activities and taking part in exercise programs. The high mean result indicates a strong sense of personal agency and initiative among the respondents.

In relation to this, a study by Smith et al. (2021) examined the relationship between initiative and mental toughness in sports. The study found that athletes who demonstrated higher levels of initiative and proactiveness exhibited greater mental toughness and performance. It emphasized the importance of taking initiative in developing and maintaining sport mental toughness [Smith et al. 2021).

In conclusion, the data from Table 13 suggests that the student-respondents in selected universities in China demonstrate a strong sense of initiative and proactiveness in their actions, emotions, and participation in exercise programs. They take initiative over their own actions and emotions.

Table 14. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Growth

Items	Mean	Std.D	Interpretation	Rank
I exercise more to grow up psychologically	3.95	.222	Strongly agree/highly satisfied	4.5
I exercise more to promote emotional growth	3.97	.159	Strongly agree/highly satisfied	2
I exercise more together with my classmates to promote mutual growth	3.96	.186	Strongly agree/highly satisfied	3
I participate in more activities to promote my personal growth	3.95	.222	Strongly agree/highly satisfied	4.5
I regularly more exercise programs to promote my personal physical and mental growth	4.00	.045	Strongly agree/highly satisfied	1
Composite mean	3.97	.167	Strongly agree/highly satisfied	

N=500.Legend:

4-3.51-4.00-Strongly agree/highly satisfied;3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied;1-1.00-1.50-Strongly disagree/not highly satisfied

Table 14 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of their Growth. In general, the data shows that the respondents are highly satisfied with a mean result of 3.97.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 4.00 "I regularly more exercise programs to promote my personal physical and mental growth".#2 has the mean result of 3.97 "I exercise more to promote emotional growth".#3 has the mean result of 3.96 "I exercise more together with my classmates to promote mutual growth".#4 has the lowest mean result of 3.95 "I exercise more to grow up psychologically" and "I participate in more activities to promote my personal growth".

It is observed that all indicators have mean results of 3.95 and above, It shows that the consistency and satisfaction of the respondents were true. The indicator "I regularly participate in more exercise programs to promote my personal physical and mental growth" has a mean of 4.00. The indicator "I exercise more to promote emotional growth" has a mean of 3.97, the indicator "I exercise more together with my classmates to promote mutual growth" has a mean of 3.96,

The indicators "I exercise more to grow up psychologically" has a mean of 3.95, the indicator "I participate in more activities to promote my personal growth" has a mean result of 3.95, and This data suggests that the student-respondents perceive exercise as a means to promote their psychological, emotional, and personal growth. They exercise more to enhance their psychological well-being, promote emotional growth, foster mutual growth with their classmates, and facilitate personal growth. The high mean result indicates a strong recognition of the growth potential that exercise offers.

In relation to this, a study by Guo et al. 2019) explored the role of exercise in promoting personal growth and mental toughness. The study found that individuals who engaged in regular exercise reported higher levels of personal growth and resilience. It emphasized the positive impact of exercise on psychological and emotional well-being, as well as personal development [Guo et al. 2019).

In conclusion, the data from Table 14 suggests that the student-respondents in selected universities in China perceive+ exercise as a catalyst for their psychological, emotional, and personal growth. They recognize the benefits of exercise in promoting personal well-being, emotional growth, mutual growth with classmates, and overall personal development. This growth-oriented mindset contributes to their overall sport mental toughness and personal growth.

Table 15. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Environmental Mastery

Items	Mean	Std.D	Interpretation	Rank
I do regular exercises in a safe and clean environment	3.99	.109	Strongly agree/highly satisfied	2.5
Regular participation in exercises in a well-ventilated environment is good for my health	3.91	.284	Strongly agree/highly satisfied	5
I exercise together with my classmates to strengthen the control of our environment	3.92	.268	Strongly agree/highly satisfied	4
I exercise together with your classmates and adapt to environment's present condition	4.00	.000	Strongly agree/highly satisfied	1
I have a control of my environment's situation by exercising the body and mind	3.99	.089	Strongly agree/highly satisfied	2.5
Composite mean	3.96	.310	Strongly agree/highly satisfied	

N=500.Legend:

4-3.51-4.00-Strongly agree/highly satisfied;3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied;1-1.00-1.50-Strongly disagree/not highly satisfied

Table 15 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of their Environmental Mastery. In general, the data shows that the respondents are highly satisfied with a mean result of 3.96.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 4.00 "I exercise together with your classmates and adapt to environment's present condition". #2 has the mean result of 3.99 "I have a control of my environment's situation by exercising the body and mind". #3 has the mean result of 3.99 "I do regular exercises in a safe and clean environment". #4 has the mean result of 3.92 "I exercise together with my classmates to strengthen the control of our environment". #5 has the mean result of 3.91 "Regular participation in exercises in a well-ventilated environment is good for my health".

It is observed that all indicators have a mean result of 3.91 and above. It shows that the consistency and satisfaction of the respondents were true. The indicators "I do regular exercises in a safe and clean environment" has a mean of 3.99, the indicator "Regular participation in exercises in a well-

ventilated environment is good for my health" has a mean of 3.91, the indicator "I exercise together with my classmates to strengthen the control of our environment" has a mean of 3.92, the indicator "I exercise together with your classmates and adapt to the environment's present condition" has a mean of 4.00, and the indicator "I have control of my environment's situation by exercising the body and mind" has a mean of 3.99.

This data suggests that the student-respondents recognize the importance of environmental mastery in their exercise routines. They prioritize exercising in safe and clean environments, such as well-ventilated spaces. They also acknowledge the role of exercising with classmates in strengthening their control over the environment and adapting to present conditions. Additionally, they believe that exercise empowers them to have control over their environment's situation, both physically and mentally.

In conclusion, the data from Table 15 suggests that the student-respondents in selected universities in China prioritize exercising in safe and clean environments, recognize the benefits of well-ventilated spaces for their health, and value the control and adaptability they gain through exercising with classmates. They believe that exercise empowers them to have control over their environment's situation, both physically and mentally. This focus on environmental mastery contributes to their overall sport mental toughness and well-being.

Table 16. Evaluation of the Respondents on the Level of Sport Mental Toughness in Terms of Respondents Endurance

Items	Mean	Std.D	Interpretation	Rank
I strengthen my endurance through exercise	3.99	.109	Strongly agree/highly satisfied	1
I improve my endurance through exercise	3.95	.222	Strongly agree/highly satisfied	4.5
Through training with classmates, mutual tolerance	3.97	.159	Strongly agree/highly satisfied	2
I come by participating in sports associations or other activities improve endurance	3.96	.186	Strongly agree/highly satisfied	3
I have the ability to accept my own limitations when there is a need to adjust in exercising and playing in different ways	3.95	.222	Strongly agree/highly satisfied	4.5
Composite mean	3.96	0.180	Strongly agree/highly satisfied	

N=500.Legend:

4-3.51-4.00-Strongly agree/highly satisfied;3-2.51-3.50-Agree/satisfied;

2-1.51-2.50-Disagree/not satisfied;1-1.00-1.50-Strongly disagree/not highly satisfied

Table 16 shows the evaluation of the student-respondents' responses on the Level of Sport Mental Toughness in Terms of their Endurance. In general, the data shows that the respondents are highly satisfied with a mean result of 3.96.

Looking closely at the means of the different indicators, indicator #1 has the highest mean result of 3.99 "I strengthen my endurance through exercise". #2 has the mean result of

3.97 "Through training with classmates, mutual tolerance". #3 has the mean result of 3.96 "I come by participating in sports associations or other activities improve endurance". #4 has the lowest mean result of 3.95 "I improve my endurance through exercise" and "I have the ability to accept my own limitations when there is a need to adjust in exercising and playing in different ways".

It is observed that all indicators have the same mean result of 3.95 or above. It shows that the consistency and satisfaction of the respondents were true. The indicator "I strengthen my endurance through exercise" has a mean of 3.99, "Through training with classmates, mutual tolerance"

has a mean of 3.97, the indicator "I come by participating in sports associations or other activities to improve endurance" has a mean of 3.96, the indicator "I improve my endurance through exercise" has a mean of 3.95, the indicator and the indicator "I have the ability to accept my own limitations when there is a need to adjust in exercising and playing in different ways" has a mean of 3.95. This data suggests that the student-respondents recognize the importance of endurance in their exercise routines. They actively work on strengthening and improving their endurance through exercise. They value the training with classmates, which fosters mutual tolerance and contributes to their endurance. Additionally, they believe that participating in sports associations or other activities helps them improve their endurance. They also demonstrate the ability to accept their own limitations and make adjustments when necessary during exercise and play.

In relation to this, a study by Nuno et al. (2023) examined the relationship between endurance and mental toughness in sports. The study found that athletes with higher levels of endurance demonstrated greater mental toughness and resilience. It emphasized the significance of endurance training in developing and maintaining sport mental toughness (Nuno et al. 2023).

In conclusion, the data from Table 16 suggests that the student-respondents in selected universities in China prioritize the development and improvement of endurance through exercise. They value the training with classmates and recognize the benefits of participating in sports associations or other activities for enhancing their endurance. Their ability to accept limitations and make adjustments contributes to their overall sport mental toughness and resilience.

The study aimed to gain insights into the level of participation in sports activities and sports mental toughness of college students in five different institutions. The study employed a quantitative research design to investigate 500 voluntary respondents who provided valuable data for analysis utilizing descriptive statistics, ANOVA, correlation analysis, and frequency distribution, the research analyzed data collected from the respondents. The profile of the student respondents shows a nearly equal distribution of male and female respondents, with a slightly higher number of female respondents. This indicates a diverse representation of both genders in the study, allowing for a comprehensive understanding of the research topic.

The majority of the respondents belonged to the 20–21 and 22–year-old age groups, indicating that these ranges are especially important to consider when analyzing college students' involvement in sports and their level of sports mental toughness. The respondents engaged in a variety of physical exercise types, reflecting their diverse interests and preferences. Notably, aerobic training, kung fu martial arts, and team sports emerged as the most popular activities among the respondents. Moreover, the analysis of sports habits revealed that a significant portion of the respondents allocated time for sports activities multiple times a week.

The analysis also showed that college students display a positive inclination towards maintaining a regular habit of physical exercise. They actively engage in various sports activities both within and outside the campus environment, indicating a high level of participation and involvement. The students report having regular physical exercise habits and actively joining clubs for physical exercise, demonstrating their commitment to staying active. The data from the study

also reveals that college students engage in physical exercise activities with their classmates, friends, and family members. They actively participate in physical exercise with their family members and take part in campus physical exercise on weekends. They also show willingness to participate in physical exercise activities organized by the community during weekends. This indicates a strong personal motivation and a positive attitude towards physical exercise among the surveyed college students.

The results also suggest that the null hypothesis that there is no significant difference in the level of participation and motor mental resilience level among college students will not be rejected. However, when comparing the respondents' participation level and grade level, the results indicated that there was no significant difference in participation level by grade level. In addition, all the respondents responded positively to the levels of motor mental resilience, such as Confidence, Constancy, Confidence, Control, Cognize, Positive relationship, Initiative, Growth, Environmental mastery, Endurance and other aspects. This suggests that respondents perceived a positive effect on their psychological resilience through physical exercise. The results also showed that there was no significant difference in the level of sports psychological resilience when using the profile as a factor. This means that college students often exhibit similar levels of motor mental resilience, regardless of their individual characteristics.

The correlation test which was conducted to examine the relationship between the level of sport participation and the level of sports mental toughness among college students indicated a significant relationship, leading us to reject the null hypothesis. This only indicates that there is a significant correlation between college students' participation in sports and their level of sports mental toughness.

## 6. Conclusion

There was a diverse representation of both sex in the study, allowing for a comprehensive understanding of the research topic. The majority of the respondents were between the age range of 20–21 and 22-year old, indicating that these ranges are especially important to consider when analyzing college students' involvement in sports and their level of sports mental toughness. The research findings may be applied to college students at different phases of their academic journeys, as seen by the analysis's very even distribution across grade levels. The respondents engaging in a variety of physical exercise types showed the importance of providing a range of sports options to cater to the varied interests and needs of college students.

This finding also emphasized the dedication and commitment of college students towards maintaining regular physical activity in their busy schedules. It also underscores the importance of promoting a healthy and active lifestyle among this group.

The respondent's active participation in physical exercise with their family members, in campus physical exercise on weekends and willingness to participate in physical exercise activities organized by the community during weekends indicates a strong personal motivation and a positive attitude towards physical exercise among the surveyed college students. The result of the study also highlights the importance of enhancing the involvement and support of teachers and coaches to encourage students' participation in physical exercise.

The findings indicated that regardless of their individual characteristics, college students generally exhibit similar levels of sports mental toughness and that this significant correlation between college students' participation in sports and their level of sports mental toughness.

In conclusion, the survey results emphasized the value of sports in promoting mental wellness. Sports participation was positively correlated with sports mental toughness, suggesting that sports engagement might enhance confidence, resilience, self-control, and general well-being. Sports offered chances for self-improvement, fulfilling relationships, and a feeling of purpose in life. Sports can therefore improve our mental health when we participate in them.

## 7. Recommendations

Based on the study's findings, several proposals for an enhanced sports program can be considered. These proposals aim to further promote the development of sports mental toughness among college students. The following proposals were made:

1. **Mental Toughness Training:** Implement a structured mental toughness training program that focuses on enhancing key aspects such as confidence, resilience, control, and . This program can include workshops, seminars, and individual or group coaching sessions led by sports psychologists or mental toughness experts.

2. **Mentorship and Role Models:** Establish mentorship programs where experienced athletes or alumni can mentor and inspire college students. This can provide guidance, support, and motivation to develop sports mental toughness. Inviting successful athletes as guest speakers or organizing panel discussions can also offer valuable insights and role models for aspiring athletes.

3. **Making sport available for all:** Ensure inclusivity and accessibility by offering different sports activities suitable for students with different abilities and interests and also promote participation in sports regardless of skill level, gender, or background. This can create a welcoming and inclusive sports culture that encourages personal growth and development.

4. **Evaluation and Feedback:** Regularly assess the effectiveness of the enhanced sports program through surveys, feedback sessions, and performance evaluations. This feedback can enable us to identify areas where improvement is needed and tailor the program to better meet the needs and preferences of college students.

These proposals are based on the study's findings and aim to enhance sports activities and sports mental toughness among college students. Implementing these recommended proposals can contribute to a more comprehensive and impactful sports program.

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