

Research on Effects of Physical Exercise on Graduate Students' Mental Health

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Keywords: University Graduate Students; Physical Exercise; Mental Health; Psychological Therapy

Abstract. This article features a random survey the author conducted among graduate students in 12 higher education institutions in Guangdong Province to evaluate the status of their exercise and mental health. The survey aims at examining the relationship between graduate students' exercise and their mental health. Through comparison of the factors of mental problems that I found out in my survey with the regular module nationwide, I hope that introducing exercise-psychotherapy may provide effective theoretical basis for this target group. The research methods used in this study include 1. Questionnaire-survey; Questionnaire was distributed to 1200 participants from 12 schools and was requested to be completed anonymously, independently; 2. Expert interview: interviewed 12 school psychiatrists and 15 physical education teachers. 3. Data collection: China Zhi web, Wanfang data system, Weipu website of Chinese science and technology periodicals, PubMed, Web of Science. Statistical data processing: original data processed by SPSS statistic software. Result: Data disclose that there is considerable difference between the willingness and the real action of exercise among graduate students in Guangdong as a group. The average time and frequency of exercises are considerably inadequate. The group mental health level is poor and psychological problems stand out.

Introduction

China is currently undergoing a broad, in-depth transformation in social ideology. Such transformation breaks the previous human behaviors and relations. With the rapid social development, the criterion for talents are more and more competitive. In the meantime, the pressure of society and life invisibly imposes more psychological burdens on the young and highly educated. With rapid social development and transformation of various factors, mental equilibrium is broken. People become anxious and the inability to adapt to these factors seriously results in the increase of mental stress element [2]. Therefore, the ability to stand against stress is undergoing crucial ordeal. All kinds of behavioral and psychological hurdles are elevated, especially to highly educated college students. In order to improve the mental health status of college students, in as early as 1985, Shanghai Jiaotong University set up the first counselling office, Yi You Counselling Center, for college students. Till today, 90% of the 1000 plus colleges have set up counselling offices. Of the 12 colleges that I conducted my survey for this article, 9 schools have their own counselling office.

However, there is extreme disproportion between those who come for counselling and those having psychological problems, according to the psychiatrists. Counselling offices are like a virtual institution and college students' mental health is always a worrisome problem. Considering these concerns, this article describes a random survey in 12 higher education institutions among graduate students on their sports, exercise, and mental health status. I hope that the introduction of exercise-psychotherapy may provide effective theoretical basis for this target group.

Research Participants and Methodology

Research Participants. Randomly selected 1200 graduate students from 12 institutions, including nationally and provincially accredited colleges, and regular colleges participated as research subjects. The institutions include Zhongshan University(ZU), Huanan Institute of Technology(HIT), Jinan University(JU), Huanan Normal University(HNU), Huanan Agricultural University(HAU), Guangzhou University(GU), Guangdong Industrial University (GIU), Guangzhou Foreign Languages Institute (GFLI), Guangzhou University of Traditional Medicine (GUTM), Nanfang Medical University (NMU), Shenzhen University (ShenU), Shantou University (ShanU). There are 670 male and 530 female participants.

Table 1 Distribution of survey participants in the following institutions

Institution	ZU	HIT	JU	HNU	GU	GIU	GFLI	GUTM	HAU	NMU	ShenU	ShanU
Number of participants	155	140	160	100	60	60	90	86	110	90	80	69
Male/Female	95/60	76/64	85/75	59/41	35/25	37/23	33/57	51/35	65/45	80/10	45/35	44/25

Research Instruments. The research instrument used in this research is SCL-90 (Self-Report Inventory), which is generally used in China and all over the world. SCL-90 has 9 factors and 90 entries. This chart has been revised and adopted in China and it is publicly acknowledged to having the advantage of completeness and precision in reflection of syndromes. The effectiveness index is between 0.77-0.99. The result of valuation is high in precision and effectiveness. The score for each item in the questionnaire is divided into 5 levels. The score for each factor is the average for this factor. The higher the average is, the lower the mental health level is. The lower the average is, the higher the mental health level is. This study uses the composite symptom index and variable score as data for statistics analysis. The composite symptom index, known as overall average in China, is the result of the total sum divided by 90. The variable score indicates the symptom of the patient for each individual variable. The variable score helps us understand each symptom and its distribution characteristics.

Research Methods.

Questionnaire. The study uses questionnaire-survey. The Questionnaire was distributed to 1200 participants from 12 schools and was completed anonymously and independently.

Table 2 Distribution and Collection of Questionnaire

Distribution	Collection	Void	Validity
1200	1163	37	96.9%

Expert Interview. 12 school psychiatrists and 15 physical education teachers were interviewed as experts.

Documents Collection. Data was also collected from online sources such as China Zhi web, Wanfang data system, Weipu website of Chinese science and technology periodicals, PubMed, Web of Science. Duration of data collection: 2007-2017.

Statistical Data Processing. Original statistical data was processed by SPSS statistic software.

Result and Analysis

Graduate students' participation in sports and exercise. The survey questions focused on the graduate students' willingness to participate in sports and exercise.

Table 3 Survey on the willingness of participation in sports and exercise

Item	Distribution	Valid	Yes	No
Number	1200	1163	1116	47
Percentage	100%	96.9%	95.9%	4.1%

According to the survey, 95.9% of the graduate students have expressed strong desire to participate in sports and exercise. If the faculty of physical education could give them guidance, provide more opportunities for exercise, they may be able to engage themselves in active physical practice. However, further investigation disclosed that the number of this group of people who would be able to stick to regular exercise (at least 3 times a week and more than 40 minutes each time) was not an optimistic one, which would be less than 30% of the total amount. Among those who regularly exercise, male students take up 76.3% and female 23.7%. The data indicates that there is a great difference between the actual practice and the expressed willingness of exercise among Guangdong graduate students as a group.

Preliminary Analysis. The study shows that three factors help explain the graduate students' behaviors and mindsets in sports and exercise. First, the most essential reason that causes the great discrepancy of actual exercise and willingness to participate is the inadequacy in organization, guidance and administration of college physical education. According to the research data, there are less than 10% colleges that offer physical education as elective courses in China. In Guangdong Province, there are only two colleges that have physical education in their curriculum. The shortage of necessary resources to provide sports and exercise opportunities for college graduate students results in low participation rate and inactivity.

Second, the Ministry of Education has no mandatory regulation on setting up physical education class for graduate students. As a result, colleges neglect to foster this group of people's sense and ability of exercise. The habit of exercise is the internal push for exercise awareness. Systematic sports and exercise training may help them form this habit. Physical education in colleges seem to neglect to foster the group's internal push force.

Third, the lack of resources such as space and equipment also contributes to the lack of participation for this particular group of students. With the expansion of college enrollment, student body increased rapidly. The budget is extremely short so that the already inadequate equipment facilities are stretched to meet the demand of undergraduates. Therefore, there is hardly any space left for the already neglected graduate students, to say nothing about systematic exercise. All these difficulties greatly hinder the interest and willingness of this group to do physical exercise.

The Motive of Guangdong graduate students to exercise. The motive to exercise refers to the inner drive that pushes the subject to engage in sports and exercise. It reflects the subjective reason and psychological state that maintain such a drive. The action of sports and exercise is the outcome of this motive. Table 4 shows the motive of graduate students participating in sports and exercise.

Table 4 Survey on the Motives of graduate students' participation in sports and exercise

Item	Ranking (of Choice)	Frequencies (of Choice)	Average Index
Physical and Mental Health	1	708	2.55
Diverse cultural life	2	625	2.25
Social interaction	3	130	0.42
Pursuit of beauty	4	110	0.38
Pass exams	5	87	0.27
Others	6	82	0.26

※ Average index = frequencies of choice ÷ average time of choice

Table 4 shows that the motives to participate in sports and exercise range from health concerns, diversity of cultural life, social interaction, and pursuit of beauty.

Characteristics of graduate students' choice of sports and exercises in Guangzhou. Table 5 focuses on the characteristics of the kinds of sports and exercises graduate students choose to participate in.

Table 5 Survey on events of sports and exercises graduate students take

Item	Ranking (of Choice)	Frequencies (of Choice)	Average Index
Tennis	1	448	1.74
Basketball	2	440	1.71
Soccer	3	357	1.03
Badminton	4	295	1.13
Aerobic dances	5	149	0.57
Others	6	46	0.31

Most of the graduate students of this survey choose the sports and exercise events on voluntary basis. They made their choices according to their needs, interests, and preferences about the events. Their preferred choices include playing the tennis, basketball, soccer, badminton, which are the most favored sports and exercises among graduate students in Guangdong province. Male students prefer tennis, basketball, soccer and badminton, and female students prefer aerobic dance and badminton.

Time spent on sports and exercise by graduate students in Guangdong. The study asked about the "average time allotted for physical exercise" and "length of time for physical exercise" and found out that 43.5% of the people spend 40 minutes to one hour on sports and exercise. 21.8% of them spend less than 30 minutes on exercise and 34.7% spend more than an hour.

Table 6 Survey on time spent on sports and exercise by graduate students in Guangdong

Time (month)	0 - 6 months	6 - 12 months	More than 12 months
Percentage	35.7%	35.3%	29%

A Perspective on mental health of graduate students in Guangzhou The study compares the mental health conditions of male and female graduates in Guangdong with the national pattern.

Table 7 Variable average and standard deviation using SCL – 90 for graduate students in Guangzhou as compared with the national pattern.

SCL-90 Variables	Domestic Pattern X±SD	Graduate Students in Guangzhou as a whole X±SD	P
Somatization	1.37±0.48	1.566±0.547	p<0.01
Obsession	1.62±0.58	1.82±0.49	p<0.05
Sensitivity to human relationship	1.65±0.61	1.71±0.46	p>0.05
Depression	1.50±0.59	1.79±0.63	p<0.05
Anxiety	1.39±0.43	1.51±0.61	p<0.05
Hostility	1.46±0.55	1.51±0.39	p>0.05
Horror	1.46±0.55	1.51±0.39	p>0.05
Paranoia	1.43±0.57	1.69±0.58	p<0.05
Psychic disorder	1.29±0.42	1.57±0.54	p<0.01
Total average	1.44±0.43	1.63±0.47	p<0.05

In recent years, the government and academic scholars attach great importance to college students' mental health and have done a great number of tests. It is generally acknowledged that currently the group mental health level is poor and psychological problems are prevalent. The table above shows that the variable average and standard deviation for graduate students in Guangzhou, ranging from 1.30-1.90, are relatively higher. This finding matches research studies conducted in the past. With a higher variable average, graduate students in Guangzhou fare more poorly in terms of their mental health conditions as compared to the national pattern. The difference between the Guangzhou regional average and the national pattern indicated by p , which is lower than 0.05, indicates that students show slight pain with symptoms in depression, somatization, obsession, paranoia, anxiety, and psychic disorder. The average score plus 1.96, the standard deviation, amounts to more than 3 points. This shows that the mental health of graduate students in Guangzhou reaches to a moderate pain level and requires serious attention. Compared to the national pattern, average variables score slightly higher in items such as hostility, horror, and sensitivity to human relationship, but they are not statistically significant. Overall, depression, anxiety, paranoia, somatization, and psychic disorder are the major symptoms among graduate students in Guangzhou.

Positive Impact of Physical Exercise on Mental Healthy. Physical exercise has always been considered one of the psychological therapeutic methods that "exercises the heart". Physical exercise is believed to have the power to facilitate the improvement of the emotions and restoration of mental health. In a fast-paced society, all kinds of changes and transformation led to tension, depression, and unhealthy mental conditions for the students in the Ivory Tower. Physical exercise therefore could potentially transfer the individual unhappy senses, emotions, and behaviors, and in turn lift people from disturbances and pains. A survey in the United States shows that 80% of the 1750 psychologists believe that physical exercise is one of the effective methods to treat depression. 60% of them think that physical exercise could be used as one way to relieve anxiety. The graduate students as a group inevitably face great pressures resulting from all kinds of changes in society. They could experience anxiety and depression caused by setbacks. If higher education institutions could provide a purposeful and well-organized physical education curriculum, plan effective extracurricular activities, and create platforms and opportunities for students to participate in all kinds of physical exercises, this particular group could find an outlet to reduce the pressure to the lowest level, reduce potential mental health issues, and help treat mental health problems.

Conclusion and Recommendations

The findings of the study on student participation of physical exercises indicate discrepancies in their willingness and actual participation. First, 95.4% of the students in the study demonstrate willingness to participate in physical exercises, but only 28.7% actually participate in regular physical exercises. Second, the concept of "lifelong physical exercise" is still a weak idea, and students do not show strong capacity to participate actively in physical exercise. Third, most students are still influenced by a test-driven physical education model. Last, the lack of sufficient resources for physical exercises on college campuses is an important factor that restricts the choice most graduate students can make in physical exercises.

Compared to the national pattern, the mental health condition of graduate students in Guangzhou has the following characteristics. The average and standard deviation of graduate students in Guangzhou in terms of individual variables covered in SCL-90 fall between 1.30 to 1.90. This indicates that the mental health conditions of graduate students in Guangzhou are relatively lower than the national average. The total average points of the graduates in Guangzhou are higher than the national average. Such a difference between the regional and national data, which shows P is lower than 0.05, indicates that depression, anxiety, somatization, and mental disorders are the major symptoms for the psychological barriers or mental health problems among the graduates in Guangzhou. This reflects that the graduate students in Guangzhou undergo lots of psychological pressures in terms of their professional development, competition in society, and emotional life.

Universities are recommended to offer lectures about physical exercise and mental health and elective courses in physical education for graduate students, establish a sense of “lifelong physical exercise” to improve physical capacities. Meanwhile, graduate students should be encouraged to actively participate in all kinds of sports clubs to improve their ability to exercise, socialize, and adjust to their campus environment. Adequate physical exercise helps graduate students resist pressure and moderate their mental conditions to face all kinds of challenges with a positive attitude.

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