

Relationship between Amount of Exercise and the Meaning in Life among the Adolescent: A Survey of 150 Chinese School Students

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Abstract

The overall living standards of human beings have improved greatly with the continuous economic and social development, but the new lifestyles have also resulted in reduced physical activity and increased psychological stress, especially among the adolescent. To improve the physical and mental health of students, it is particularly vital to strengthen physical education, emphasize mental health education and life education. Meaning in life is one of the important indicators predicting individual psychological health, and adolescence is an important stage in the exploration of students' meaning in life, so a probe into the relationship between active physical activity and meaning in life among the adolescent is of great significance for teaching practice. In this paper, we conducted a correlation analysis based on data from a questionnaire survey of 150 school students using the Physical Activity Rating Scale and the Meaning in life Questionnaire (MLQ). It's revealed that there is a significant positive correlation between physical exercise and the Meaning in Life among school students and school students are more likely to discover and have meaning in life when their amount of exercise increases.

Keywords

Amount of Exercise, Meaning in Life, Adolescent

1. Introduction

Physical exercise is a type of sport that is performed by means of physical exercises and exercise loads, with fitness and aesthetics, recreation and leisure, health care and rehabilitation, and psychological and intellectual exercise as the content

of activities, in order to enhance physical fitness, improve physical and mental health, and improve and maintain the ability of the organism (Liu, 2009). Richards (1972) argues that the meaning of life is a subjective consciousness of man, which is difficult to be easily captured and described by the subject, but related studies report that both physical exercise and meaning in life are important for the development of human mental health especially for the young generation and adhering to physical exercise can not only improve the physical quality of students but also advance their psychological quality.

For example, Zhu et al. (2020) pointed out that participants' levels of state anxiety, depression, tension, and psychological disturbance were significantly reduced, and their energy and pleasure levels were evidently improved after their physical exercises. Similarly, Rahawi et al. (2021) found that physical exercise can effectively improve the ability of emotion regulation, maintain the positive emotions of college students, and promote the physical and mental health of students. Zhang & Shilko (2020) also used the SDS depression self-assessment scale and physical exercise assessment scale to survey 350 Chinese students in some Russian universities and found that increasing the amount of physical activity can effectively improve depression and be beneficial to the development of mental health of Chinese students studying in Russia.

To sum up, it has been proved that physical exercises, to a great extent, help improve people's mental health and it's reasonable for us to reach the hypothesis that physical exercises would benefit the young people in terms of seeking their meaning in life. However, the causality needs to be justified with powerful evidence. As is known to all, exercising not only helps improve focus and provides the individual with a longer attention span, but also makes the body produce endorphins, which are known as the "feel-good" hormone that reduces depression and anxiety of an individual. However, the benefit varies from person to person, among which the frequency and amount of exercise emerges as one of the key variables. To have a clear understanding of their correlation relationship, there shall be two scales to measure the intensity of exercise and the mental status of the subjects respectively, which is to be further elaborated in the section below. The main purpose of this paper is to figure out how amount of exercise exerts its influence on the discovery of meaning in life among school students, which will lay a solid foundation for further cross-sectional research into physical and mental health of the adolescent and at the same time provide insights for P.E teachers when designing their courses.

2. Methodology

For the convenience of research, we employed the whole group sampling method in February 2022 to select 150 school students from grades 7, 8, and 9 of a Chinese secondary school where the author worked for as the subjects of this research. All the respondents are within a similar age range from 13 to 15 and they have the same curriculum at the same school and report no physical and mental

issues. Questionnaires were then distributed to the respondents and collected on site. A total of 142 valid questionnaires were returned, with a valid return rate of 95.9%, among which 44.4% were completed by male students and 55.6% for female students. The data obtained from the survey were subjected to one-way ANOVA and correlation analysis using the data statistical analysis software SPSS 23.0, and the test results were expressed as mean \pm standard deviation ($M \pm SD$).

2.1. Measurement of Physical Activity

The amount of exercise is an important indicator that reflects the degree or level of exercise that an individual can achieve when participating in physical exercise activities. Chinese scholars (Jiang et al., 2009) believe that its composition is mainly based on the exercise intensity, exercise duration and exercise frequency of individuals participating in physical exercise. In this paper, we use the Physical Activity Rating Scale (PARS-3) that was compiled by Japanese researcher Koshimoto Hashimoto and then revised by researchers, such as Liang Deqing (1994) from the Wuhan Institute of Physical Education. The scale measures the amount of exercise of physical exercisers in three parts: the intensity of physical activity, the time of each exercise, and the frequency of exercise, and has high reliability and validity. The scoring method is written as an Equation (1): "Amount of exercise" = "Intensity of exercise" \times "Time of exercise" \times "Frequency of exercise" (Yuan et al., 2022). The standard of the amount of exercise is: a small amount of exercise is less than or equal to 19 points, a medium amount of exercise is between 20 and 42 points, and a large amount of exercise is 43 points or more. The retest reliability of the scale was 0.82, which has good reliability.

2.2. Measurement of Meaning in Life

To measure the meaning in life of the respondents, we used the Meaning in Life Questionnaire (MLQ) developed by Steger et al. (2006), which contains two factors, Presence of Meaning (MLQ-P) and Search for Meaning (MLQ-S), with alpha coefficients of 0.81 and 0.84 for the two factors, and retest reliability of 0.70 and 0.73, respectively. The Chinese version of the Questionnaire (C-MLQ) was developed by Wang & Dai (2008) with 10 questions in total, and uses a 7-point Likert-type scale ranging from 1 (Absolutely True) to 7 (Absolutely Untrue). The higher the score, the higher the physical activity of the individual. A total score equal to or less than 19 is considered a small amount of exercise, 20 to 42 is considered a moderate amount of exercise, and a score equal to or greater than 43 is considered a large amount of exercise. The internal consistency reliability of this questionnaire ranged from 0.82 - 0.86, and the correlation coefficient of retesting after two weeks interval also reached a high correlation, meeting the requirements of psychometrics (Wang, 2013).

The questionnaires have both good reliability and validity and simple structure and clear questions, making it easier for school students to understand and answer. In this study, we use the Physical Activity Rating Scale and the Chinese version of the Sense of Meaning in Life Scale to conduct the research.

3. Results and Analysis

First of all, before digging into the correlation analysis, it's necessary to have an overall picture of the current status of respondents' exercise intensity and a descriptive statistic of each dimension of the Physical Activity Rating Scale is shown in **Table 1**.

According to the statistics in **Table 1**, 38.7% of the school students have a small amount of exercise in their daily physical activity while 36.6% for medium amount of exercise; and 35 school students, 24.6% of the total, were involved in large amount of exercise. In other words, the majority of respondents have small to medium amount of exercise in their daily life. In order to understand the relationship between physical activity and meaning in life among school students, we conducted a correlation test using the respondents' exercise amount and two factors of MLQ scale as variables, and the results are shown in **Table 2**.

As suggested in **Table 2**, the scores of the respondents' search for meaning in life scores and their amount of exercise showed a low positive correlation, with a correlation coefficient of 0.284. However, their scores on presence of meaning in life and overall meaning in life showed a moderate positive correlation with their amount of exercise, with correlation coefficients of 0.344 and 0.360 respectively. The significant P-values corresponding to each correlation coefficient were less than 0.05, which means that there is a significant correlation between school students' amount of exercise and their discovery of meaning in life. However, it remains to be explained on how do these variables intertwine with each other and exert its influence on the respondents' mental status? The question shall be answered with more clear and reasonable data analysis and that's why we conducted A one-way ANOVA to explore the relationship between Amount of Exercise and Meaning in Life of school Students.

Table 1. Demographic distribution of the respondents' amount of exercise (N = 142).

Amount of exercise	Respondents	Percentage (%)	Cumulative Percentage (%)
Small amount of exercise	55	38.7	38.7
Medium amount of exercise	52	36.6	75.4
Large amount of exercise	35	24.6	100.0
Total	142	100	

Table 2. Correlation analysis of amount of exercise and meaning in life of school students.

	Search for Meaning in life scores	Presence of Meaning in life scores	Overall Meaning in life scores
Scores of amounts of exercise	0.284**	0.344***	0.360***

Note: ** represents $P < 0.01$; *** represents $P < 0.001$.

According to the results in **Table 3**, there were significant differences ($P < 0.001$) in search for and presence of meaning in life among school students with different amounts of exercise. Respondents with medium amount of exercise had slightly lower scores on two dimensions of meaning in life than those with large amount of exercise, but none of the differences were significant ($P > 0.05$). In comparison, school students who have medium and large amount of exercise had significantly higher scores on two dimensions meaning in life than students with small amount of exercise ($P < 0.001$). Therefore, it could be safely concluded that school students are more likely to discover and have meaning in life when their amount of exercise increases.

4. Conclusions and Recommendations

To sum up, there is a significant positive correlation between physical exercise and the Meaning in Life among school students and school students are more likely to discover and have meaning in life when their amount of exercise increases. Therefore, in order to improve the physical and mental health of the adolescent and help them seek meaning in life, it should be encouraged to strengthen their exercise intensity and ensure they have a medium to large amounts of exercises in their daily routines.

Table 3. One-way ANOVA of the relationship between amount of exercise and meaning in life of school students.

	Amount of Exercise	M \pm SD	F value	Multiple Comparisons	P value
Search for Meaning in life scores	Small amount of exercise	34.55 \pm 12.09	27.754***	Small and medium amount of exercise	0.000
	Medium amount of exercise	49.29 \pm 11.90		Small and medium amount of exercise	0.000
	Large amount of exercise	50.91 \pm 12.16			
	Total	43.98 \pm 14.14			
Presence of meaning in life scores	Small amount of exercise	17.64 \pm 6.48	15.496***	Small and medium amount of exercise	0.000
	Medium amount of exercise	25.00 \pm 6.70		Small and medium amount of exercise	0.000
	Large amount of exercise	25.63 \pm 5.95			
	Total	22.30 \pm 7.40			
Overall Meaning in life scores	Small amount of exercise	40.7 \pm 15.47	23.691***	Small and medium amount of exercise	0.000
	Medium amount of exercise	46.27 \pm 12.72		Small and medium amount of exercise	0.000
	Large amount of exercise	44.75 \pm 13.88			
	Total	43.98 \pm 14.14			

Note: ** represents $P < 0.01$; *** represents $P < 0.001$.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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