

# Case Study on the Impact of Rhythmic Gymnastics on Adolescent Adjustment Skills: Implications for Physical Education Curriculum

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**Abstract:** With the development of society and the increase of people's attention to physical and well-being, rhythmic gymnastics, as a comprehensive sport, its impact on the well-being of teenagers has attracted wide attention. This study aims to deeply explore the potential impact of rhythmic gymnastics training on adolescent well-being through empirical research, in order to provide a scientific basis for physical education and well-being education. In this study, a quantitative research method will select students from 4 middle schools in Hangzhou, Zhejiang Province, China, as research objects, divide students into two categories: participating in rhythmic gymnastics training and not participating in rhythmic gymnastics training, and 100 students will be randomly sampled. A 4-point Likert scale will be used for the questionnaires, which will be administered from four dimensions: respondents' personal information, learning adaptation, emotional adaptation and social adaptation. The results of the study will offer substantial insights on how rhythmic gymnastics assists adolescents' adjustment skills and could be applied in managing organizations physical education in educational institutions. In this study, statistical analysis will be performed using descriptive analysis and correlation analysis on the questionnaire data.

**Keywords:** Rhythmic Gymnastics Training; Youth; Well-being; Empirical Research; Physical Education.

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## 1. Introduction

Rhythmic gymnastics, as a unique sport, has received wide popularity and attention worldwide in recent years. It is not just a sport but also an art form that combines music, dance, and gymnastics. Compared with traditional gymnastics, rhythmic gymnastics pays more attention to the fluency of movements, the perfection of skills, and the harmony of music. This enables rhythmic gymnastics not only to exercise the respondents' but also to cultivate their artistic accomplishment and aesthetic taste. As a sport with both artistic and sports characteristics, rhythmic gymnastics training has been gradually loved by the majority of young people in China. Specifically, the results obtained from the study could be useful in enhancing the physical education (PE) learning in China.

Physical Education curriculum in China is different and its emphasis is more and more laid on multiple choices in order to bring up students as a wholistic person. (Xia, 2022) Rhythmic gymnastics, which is said to enhance flexibility, coordination and self-control is practiced in some of the Chinese schools during physical and arts classes mainly in schools that have extra sections in sports or are in a position to support such activities. In many cases, these schools may employ professional trainers and equipment for rhythmic gymnastics education. But due to scarcity of facilities, trained teachers and financial resources, many schools especially those in the rural or interior areas may not be in a position to provide rhythmic gymnastics. Infusing rhythmic gymnastics into a wider context of the Chinese PE curriculum offers a good pathway to achieving this goal and ensure everyone benefits from this effective learning tool. Education officials and policy makers should address the distribution of funds and the professional development programs to increase the implementation of rhythmic gymnastics into more Chinese

schools. In recent years, with the rapid development of China's economy and society, the problems of the well-being of young people have become increasingly prominent. How to promote their well-being through effective ways has become the focus of social attention (Zhou Chunmei & Su Limin, 2023). Adolescence is an important stage of individual well-being development, and they are faced with multiple challenges, such as academic stress, social distress, and physical change.

Adolescence is the golden period of life, and well-being plays an important role in this stage. Well-being is conducive to shaping a sound personality, cultivating correct values, and also an important guarantee for improving academic performance, social skills and adapting to society. Maintaining good well-being can help prevent mental illness that may occur during adolescence and lay a solid foundation for future development (Jia Chao & Wang Wenbo, 2023). In recent years, the social attention to the adolescent well-being problems is increasing, and physical activity, as a beneficial way of body and mind, has gradually attracted people's attention. Rhythmic gymnastics, with its unique sports style and artistic expression, is considered to have a positive impact on the well-being of teenagers. Rhythmic gymnastics training can not only improve the physical quality of teenagers but also help to cultivate their aesthetic taste and innovation ability, which can have a positive impact on their well-being (Cabrejas et al., 2023). However, in the environment, teenagers are facing increasing pressure of study and life, and well-being problems are increasingly prominent, leading to the adolescent well-being factors also a diversified trend.

According to the China Youth Development Report, nearly 30 million children and adolescents under the age of 18 are affected by various emotional effects and behavioral in China. The WHO predicts that by 2025, the number of children and adolescents with well-being problems will increase by more

than half, and psychological problems will be one of the five causes of illness, disability, and death among children and adolescents. Among the first batch of mental illness patients diagnosed in Xinhua Hospital in 2022, the most important group of mental illness patients is adolescents and children, among which account for as much as 65%, and there is still a rising trend (Zhang Zhi'an & Gong Shenxi, 2022). Therefore, the present study aims to investigate the empirical impact of rhythmic gymnastics training on adolescent well-being and provide a scientific basis for adolescent well-being promotion.

Rhythmic gymnastics training has a great influence on the physical and well-being of students of different ages. For children, rhythmic gymnastics can promote children to improve their physical quality cognitive ability and emotional health. Childhood is a key period for the development of physical fitness, and rhythmic gymnastics, as a comprehensive sport, contributes to the cultivation of children's flexibility, strength, and coordination. Wenlin (2022) found that children who participated in rhythmic gymnastics training had higher physical fitness than those who did not participate in the training, which laid a good foundation for their all-round development. For teenagers, rhythmic gymnastics can well improve their body image and self-esteem, relieve their pressure, effectively regulate their emotions, and improve the social skills of teenagers in the training. Adolescence I often academic pressure, social pressure, and other troubles, and rhythmic gymnastics, as a sport with a high degree of freedom, helps to relieve these pressures (Bisagno et al., 2022). Some studies have found that by participating in rhythmic gymnastics training, teenagers can better regulate their emotions, reduce negative emotions, and improve their positive attitude life (Liu Yang, 2018). For college students, rhythmic gymnastics training can greatly release psychological pressure and adjust the psychological state, but also strengthen the metabolism and promote physical health. College students are often accompanied by multiple pressures, such as academic pressure and career planning, and rhythmic gymnastics provides a way to release college students' pressure through its unique dance and movement forms. Liu Chaoyang et al. (2023) found that college students participating in rhythmic gymnastics are more able to adjust their mental state and maintain their well-being through exercise when facing a high-pressure environment.

However, the empirical research on adolescent well-being of rhythmic gymnastics training is still relatively insufficient. Most of the existing studies focus on the improvement of physical quality and the cultivation of motor skills, and their potential role in well-being has not been systematically explored, and fewer studies focus on adolescents. Therefore, this study seeks to fill this research gap and provide a new perspective for understanding the role of rhythmic gymnastics in well-being promotion among adolescents.

Adolescence is a critical period of development characterized by significant physical, emotional, and social changes. During this time, adolescents face various challenges that can impact their mental health and adjustment skills. Mental health in adolescence encompasses emotional well-being, psychological resilience, and the ability to navigate social relationships and academic pressures effectively. Adolescents often encounter stressors such as academic pressure, social dynamics, family conflicts, and the onset of identity formation. These challenges can lead to mental health issues such as anxiety, depression, and

behavioral problems if not adequately addressed. The ability to cope with these stressors is crucial for healthy adjustment and overall well-being.

Physical activities, particularly those involving structured routines and physical discipline like rhythmic gymnastics, can play a vital role in supporting adolescents' mental health and adjustment skills. Rhythmic gymnastics, which combines elements of ballet, dance, and acrobatics, requires not only physical strength and flexibility but also concentration, emotional regulation, and teamwork.

Incorporating rhythmic gymnastics into the physical education curriculum can have significant implications for promoting mental health and adjustment among adolescents. By providing opportunities for physical activity that also emphasize emotional and social development, educators can support the holistic development of students.

In conclusion, rhythmic gymnastics offers a multifaceted approach to supporting adolescents' mental health and adjustment skills. By recognizing the interplay between physical activity and mental well-being, educators can develop a physical education curriculum that not only promotes fitness but also nurtures emotional resilience and social competence in adolescents.

## 2. Theoretical Framework

Adolescence is a key period for individual well-being development, but also a period of academic, emotional, and social adaptation facing multiple challenges. As an activity that combines sport and performance, rhythmic gymnastics may play a positive role in promoting adolescent well-being. This study aims to deeply examine the well-being effects of rhythmic gymnastics training on three aspects of adolescent learning adaptation, emotional disorder, and social adaptation through self-determination theory as a theoretical framework.

The self-determination theory was first proposed by psychologists Deci and Ryan in 1985, emphasizing that individual motivation in behavior is based on satisfying three basic psychological needs: autonomy, sense of ability, and relationships (Eshkoli Tamar et al., 2023). Autonomy means that the source and motivation of individual behavior comes from internal individual interests and values rather than external pressure or rewards. Motivated by autonomy, individuals are more likely to feel pleasure and satisfaction in their behavior. Sense of competence refers to the individual's perception of their own abilities and skills. When individuals feel competent in a field, they are more likely to remain actively engaged in activities in the field. Relationships require focus on the individual's connections and social connections with others. Meeting relationship needs helps individuals to build positive interpersonal relationships and improve social adaptability. In this study, self-determination theory will be applied to analyze the effects of rhythmic gymnastics training on adolescent well-being. The researchers will explore the satisfaction of the training, including learning adaptations, emotional adaptation, and social fitness adaptation, through the measurement of autonomy, competence, and improvement through investigation, field observation, and well-being. Kritikou Marina & Giovazolias Theodoros (2022) argued that when individuals feel that these needs are met, they develop higher job satisfaction, well-being, and well-being.

### 3. Study Design and Locale

This study will comprehensively use case study design and mixed methodology, and skillfully integrate qualitative and quantitative research methods, aiming to deeply analyze the comprehensive and complex influence of rhythmic gymnastics training on adolescents' learning adaptability, emotional adaptability and social adaptability. Through this multi-dimensional research approach, this paper can not only capture quantifiable data changes, but also gain an in-depth understanding of the reasons and mechanisms behind these changes.

As part of the qualitative research, this paper will conduct in-depth interviews and participatory observations focusing on youth athletes, coaches, parents, and education experts to gather rich narratives and insights about the rhythmic gymnastics training experience. The data will help us understand how rhythmic gymnastics influences adolescent adaptive skill development at the individual level, and how these skills are shaped and manifested in specific contexts. This paper will use grounded theory analysis to encode and interpret these data, to extract conceptual frameworks, and to reveal deeper meaning. At the same time, the quantitative research will use questionnaires and standardized testing tools to collect a large amount of data from young artistic gymnastics participants in Hangzhou to measure specific indicators of learning effectiveness, emotional state and social communication ability, such as academic performance, anxiety level and the breadth and depth of social network. Statistical analysis (e.g. regression analysis, ANOVA, etc.) will be used to detect correlations and differences between the intensity, duration and background factors of the participants (e.g. gender, age, family economic status) and the fitness indicators.

Combining with the geographical and socio-economic characteristics of Hangzhou, the study will select teenagers in different regions as cases, and use a multi-level model to explore how regional differences interact with the effect of rhythmic gymnastics training, so as to further enhance the external validity of the study. Through this combination of qualitative and quantitative methods, the research can not only verify the general law, but also dig into the unique pattern in specific situations, and provide empirical basis and strategic suggestions for promoting the all-round development of adolescents and optimizing the physical education policy.

Also, Hangzhou has relatively well-developed sports facilities and a favorable climate towards the new forms of sports among which rhythmic gymnastics thus making it appropriate to study the influence of such activities in adolescents' well-being. Currently, most of the selected junior high schools have implemented rhythmic gymnastics programs thus offering a natural environment for comparative analysis with students who have engaged in rhythmic gymnastics exercises and students who have not participated in such exercises will act as a control group in the study (Liang, 2019).

According to Li (2020), the support of four selected junior high schools in Hangzhou is important for the successful implementation of the study, as all of them have developed well-being education plans and offered rhythmic gymnastics courses or interest clubs. This reduces partiality in data collection and analysis and also helps in providing necessary support and assistance to the study thus making the study

more valid and reliable.

Therefore, the case study approach incorporated in this research is appropriate for examining the complex interaction of rhythmic gymnastics involvement and adolescent adjustment proficiencies in the context of Hangzhou. This is because it enables the investigation of participants' narratives, environmental and contextual factors, and education-related implications, which will add richness and significance to the research findings in the areas of PE curriculum and adolescent well-being promotion.

### 4. Statistical Analysis of Data

This study will analyze the collected data using the following statistical treatments:

To test the reliability of the instrument, this study will test the reliability of the questionnaire using Cronbach's Alpha.

Moreover, a descriptive analysis of the questionnaire will be carried out, in which the mean value, standard deviation, and percent will be mainly used to organize and summarize the data. Zhang Yuzhu (2022) said that the mean is the sum of all observations in the sample or the number of observations, representing the central trend of the data; the standard deviation is the indicator of data dispersion or dispersion, which measures the dispersion of data points relative to the mean. With the combination of means and standard deviations, researchers are able to understand the centralized trend and dispersion of the data more fully, providing the basis for subsequent inferential statistical analysis and also being able to describe and interpret the results more accurately.

For the correlation between the test data, this study will use Spearman's rho to test the correlation between the variables. In the empirical analysis of questionnaire data, correlation is a statistical indicator used to measure the degree of association between two variables (Wenlin, 2022). The more the absolute value of the correlation coefficient is to 1, the stronger the relationship between the two variables. When the coefficient is 1 or -1, it indicates a complete positive or complete negative correlation. Therefore, correlation provides a measure of the strength of the relationship between variables, helping researchers to judge the degree of their close association.

Paired-sample t-test: The T-test is a statistical method used to compare whether there is a significant difference between two sets of averages. It calculates a T-value based on the sample data and then compares that value to a theoretical or baseline value to determine whether the observed difference is large enough that it is unlikely to be due to random factors (Wenlin, 2022). This analysis will be used to test the difference in well-being of students before and after participating in rhythmic gymnastics training.

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