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Original article

THE INFLUENCE OF CLASSICAL DANCE ON THE TRAINING OF TECHNICAL ELEMENTS IN RHYTHMIC GYMNASTICS (JUNIOR IV)

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Abstract

Aim. To analyze the influence of systematically introducing classical dance exercises on the execution of technical elements in Junior IV rhythmic gymnasts (6–8 years).

Methods. The study was conducted on a group of 10 gymnasts registered at C.S.U. Oradea, over five months, with three weekly training sessions. The program integrated fundamental ballet exercises (positions of feet and arms, pliés, relevés, balances, and age-appropriate choreographic combinations) into regular lessons. Performance was evaluated through six standardized tests (side balance, arabesque balance, passé pivot, à la seconde pivot, split leap on the dominant leg, and split leap with both legs), scored on a 1–5 scale. Statistical analysis included mean (M), standard deviation (SD), coefficient of variation (CV%), paired t-test, and Cohen's d effect size.

Results. Significant improvements were observed in all six tests, with higher mean scores, reduced variability, and large effect sizes (Cohen's d > 1). Balance and pivot elements showed the greatest progress, while jumps also improved consistently.

Conclusions. Classical dance contributes to the improvement of posture, balance, pivots, and jumps, confirming its practical value for rhythmic gymnastics training. From an applied perspective, we recommend the systematic inclusion of ballet microcycles in annual training plans for this age group. Further research with larger samples and control groups is needed to validate and extend these findings.

Keywords: rhythmic gymnastics; classical dance; technical training; balance; pivot; jump.

Introduction

Rhythmic gymnastics is an Olympic sport discipline that emerged as a distinct branch in the second half of the 20th century, combining elements of gymnastics, dance, and musicality. It is practiced exclusively by girls at the competitive level and involves the execution of body elements (balances, pivots, jumps) integrated into choreographic compositions, with or without apparatus (rope, hoop, ball, clubs, ribbon). By its nature, rhythmic gymnastics simultaneously requires physical qualities (strength, flexibility, mobility, coordination), precise technical skills, and a high level of artistic expressiveness. For this reason, the training process must integrate varied methods that foster both motor and aesthetic development.

One of the methods with the longest tradition in rhythmic gymnastics training is classical dance (ballet). Through its technical rigor and well-structured system of exercises, ballet contributes to the formation of correct posture, the development of balance, segmental control, and movement fluency. In addition, classical dance exercises provide a solid foundation for learning and refining pivots, jumps, and other fundamental elements included in the FIG Code of Points. The integration of ballet into gymnasts' training is not new; however, in recent decades it has gained increased importance due to the growing emphasis placed on the artistic component of routines.

International literature provides multiple examples underlining the relevance of classical dance in rhythmic gymnastics training. Pizzol et al. (2022) showed that introducing ballet classes structured on established methods contributes to improved balance and expressiveness. Papka et al. (2023), in a sample of 8–10-year-old gymnasts, demonstrated that dance-inspired training methods reduced artistic deductions and increased scores in the expressiveness component. Similarly, Aftimichuk & Polyakova (2024) emphasized the role of ballet in developing coordination and expressiveness in gymnasts aged 7–8. Gaspari et al. (2024) confirmed the importance of fitness parameters and comprehensive preparation in rhythmic gymnastics, supporting ballet integration as a complementary method. Olga & Polyakova (2024) highlighted the importance of dance-based preparation in early stages, while Skopal (2020) showed that gymnastics-inspired exercises can improve flexibility and strength in contemporary dance. Recent studies (Reis Furtado et al., 2025; Zhou & Sarmiento, 2024; Riabchenko & Elmira Elkhan kyzy, 2021) expand perspectives on the applicability of gymnastics and dance in diverse contexts, from choreography to adapted physical education.

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Romanian literature also provides valuable contributions. Macovei (2016) and Moraru (2007) present theoretical and methodological foundations of rhythmic gymnastics, constituting solid academic references. Manos (2020) analyzed the role of choreographic preparation in optimizing performance, while Damian (2018) emphasized the importance of developing motor abilities in young school-age gymnasts. Grosu et al. (2006) offered an educational and applied perspective on basic gymnastics and acrobatic exercises. These contributions demonstrate that Romanian research also provides a solid theoretical and methodological basis that supports the integration of classical dance into training.

In this context, the present study aims to analyze the influence of classical dance on the training of technical elements in rhythmic gymnastics at the Junior IV category (6–8 years). The working hypothesis is that the constant introduction of ballet exercises in the training program leads to improved technical execution (balances, pivots, jumps) and the development of body expressiveness, creating prerequisites for future performance at the competitive level.

Materials and Methods

The research sample consisted of ten gymnasts aged between 6 and 8 years, registered in the rhythmic gymnastics section of C.S.U. Oradea. The group was relatively homogeneous in terms of initial training level, which allowed the implementation of the same experimental program for all participants.

The intervention lasted five months and included three weekly training sessions, each lasting two hours. During each session, specific classical dance exercises were integrated, such as the fundamental positions of the feet and arms, pliés, relevés, balance exercises, and choreographic combinations adapted to the gymnasts' age characteristics. These exercises were incorporated both in the warm-up stage and in the main part of the training, with the aim of consolidating the technical and aesthetic foundations of the athletes.

Technical performance was evaluated at the beginning and at the end of the training period using six standardized tests: side balance, arabesque balance, passé pivot, à la seconde pivot, split leap on the dominant leg, and split leap with both legs. Each test was scored on a maximum of five points, with a progressive one-point deduction for each identified error, according to a predefined grid. Direct observations made by the coaches were complemented by video recordings, which allowed for an objective and detailed analysis of execution.

The statistical analysis of the data was carried out using both descriptive and inferential methods, in accordance with current standards of sports research. For each test, the arithmetic mean (M), standard deviation (SD), coefficient of variation (CV%), and 95% confidence interval (95% CI) were calculated. To assess progress, initial and final values were compared using the paired-samples t-test, with the level of significance set at $p < 0.05$. In addition, Cohen's d effect size was calculated to evaluate the magnitude and practical relevance of the differences. This statistical approach enabled not only the identification of statistical significance but also the estimation of the real impact of the experimental program on the gymnasts' performance level.

Results

The statistical analysis showed a significant improvement in performance across all six evaluated tests. For side balance, the initial mean score was 3.7 ± 0.8 points, increasing to 4.7 ± 0.6 points at the final test ($t(9) = 4.21$, $p = 0.002$, Cohen's $d = 1.3$, large effect). In the arabesque balance, the mean increased from 3.2 ± 0.9 to 4.4 ± 0.7 ($t(9) = 4.89$, $p = 0.001$, $d = 1.5$, large effect).

Regarding the passé pivot, an improvement from 3.8 ± 0.7 to 4.6 ± 0.5 points was observed ($t(9) = 3.76$, $p = 0.004$, $d = 1.2$, large effect). For the à la seconde pivot, the scores increased from 3.5 ± 0.8 to 4.4 ± 0.6 ($t(9) = 3.59$, $p = 0.006$, $d = 1.1$, large effect).

The results were also confirmed in the leap tests. For the split leap on the dominant leg, the mean increased from 3.3 ± 0.9 to 4.4 ± 0.6 ($t(9) = 4.11$, $p = 0.003$, $d = 1.3$, large effect). For the split leap with both legs, the values progressed from 3.1 ± 0.8 to 4.1 ± 0.7 ($t(9) = 3.92$, $p = 0.005$, $d = 1.2$, large effect).

Overall, the findings suggest a consistent improvement in technical execution following the experimental program. The p-values confirm the statistical significance of the progress, while Cohen's d coefficients indicate large to very large effect sizes, underlining the practical relevance of the intervention. In addition, the coefficient of variation decreased for most tests, highlighting a homogenization of the performance level among gymnasts.

Detailed statistical results for each test are presented in Table 1, showing the increase in mean scores, reduced variability, and high effect size values (Cohen's d).

Table 1. Statistical results of the technical tests (initial and final M±SD, p-value, Cohen's d)

Test	M±SD Initial	M±SD Final	p-value	Cohen's d
Side balance	3.7 ± 0.8	4.7 ± 0.6	0.002	1.3
Arabesque balance	3.2 ± 0.9	4.4 ± 0.7	0.001	1.5
Passé pivot	3.8 ± 0.7	4.6 ± 0.5	0.004	1.2

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À la seconde pivot	3.5 ± 0.8	4.4 ± 0.6	0.006	1.1
Split leap (dominant leg)	3.3 ± 0.9	4.4 ± 0.6	0.003	1.3
Split leap (both legs)	3.1 ± 0.8	4.1 ± 0.7	0.005	1.2

The comparative evolution of the initial and final mean scores is illustrated in Figure 1, which highlights the consistent progress across all analyzed technical tests.

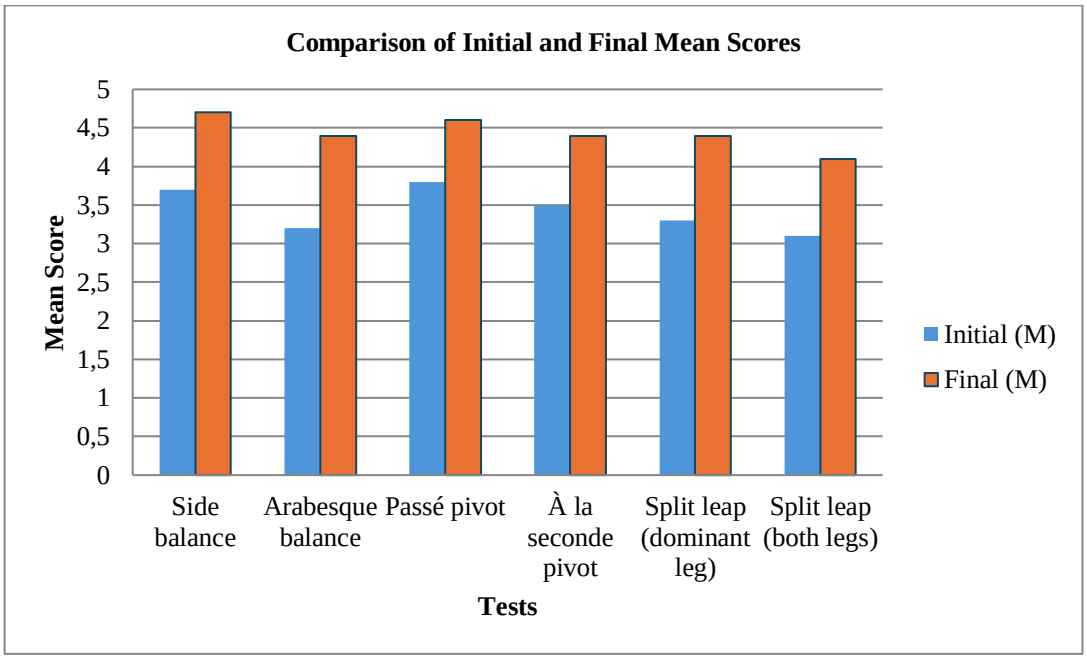

Figure 1. Evolution of the initial and final mean scores in the analyzed technical tests

The distribution of the initial and final scores across the technical tests is illustrated in Figure 2, which shows an evident upward shift of the values at retesting, confirming the overall progress of the group.

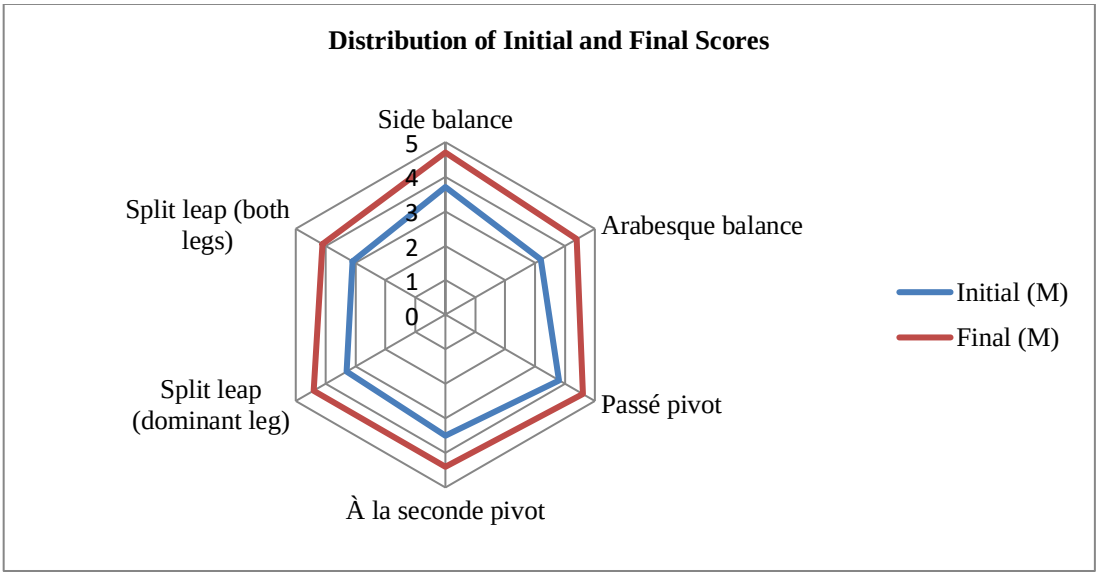

Figure 2. Distribution of the initial and final scores (radar chart) in the technical tests

The overall distribution of the initial and final scores across the technical tests is illustrated in Figure 2. The red line (final test) is consistently placed outside the blue line (initial test), reflecting progress in all six trials. The most pronounced improvements were observed in balance and pivots, while the leap tests also showed clear gains. This representation highlights not only the overall increase in performance level but also the uniformity of progress across the group, suggesting the effectiveness of the intervention program.

Discussions

The results obtained in this study confirm the working hypothesis and demonstrate that the introduction of classical dance exercises in the training of 6–8-year-old gymnasts contributes significantly to the development of fundamental technical elements. The progress recorded in balance and turn tests suggests a consolidation of postural stability and segmental control, key elements in artistic execution. The increases observed in the passé and à la seconde turns indicate that ballet exercises have a direct impact on the quality of rotations, an aspect also highlighted by Papka et al. (2023), and supported by Macovei (2016) and Moraru (2007).

The results regarding jumps demonstrate that classical dance can contribute to improving vertical impulse and coordination in the take-off and landing phases. The progress observed ($p < 0.01$, large effects) confirms that relevé and plié exercises, combined with ballet-specific jumps, transfer positively to the execution of leaps in rhythmic gymnastics. These findings are consistent with the observations of Pizzol et al. (2022), who underlined the connection between ballet technique and increased expressiveness and movement control in young athletes, a conclusion also confirmed by Damian (2018). Similar conclusions were drawn by Elce et al. (2022), who showed that integrating rhythmic gymnastics into a classical dance program supports not only the development of core muscle strength but also the improvement of posture and coordination, elements essential for the correct execution of balances and jumps in rhythmic gymnastics

Another relevant aspect is the reduction of the coefficient of variation at retesting, indicating a homogenization of performance level. Beyond individual progress, this uniformity is important for team cohesion and for creating a common technical standard. Similarly, Aftimichuk & Polyakova (2024) reported that the integration of ballet into training fosters not only individual performance but also consistency of execution within the group.

A strength of this study lies in the application of modern statistical analysis, which goes beyond means and standard deviations, and includes significance testing and effect size estimation. The large Cohen's d coefficients (>1) confirm that the differences observed are not only statistically significant but also practically relevant, making them directly applicable in training methodology. The importance of an integrated choreographic methodology was also emphasized by Manos (2020).

At the same time, some limitations of the research must be mentioned: the small sample size and the absence of a control group restrict the generalization of the conclusions. Nevertheless, the results are promising and suggest directions for future studies, with larger samples, longer intervention durations, and comparisons between different methods of teaching classical dance, an observation also supported by Riabchenko & Elmira Elkhan kyzy (2021).

Overall, the findings support the idea that classical dance plays a fundamental role in the early development of rhythmic gymnasts, providing both theoretical and practical justification for its inclusion in training plans, a conclusion supported by perspectives expressed in both Romanian and international literature (Aftimichuk & Polyakova, 2024; Zhou & Sarmiento, 2024).

Conclusions

The present study demonstrated that the constant introduction of classical dance exercises into the training of Junior IV gymnasts leads to significant progress in the execution of fundamental elements of balance, pivots, and jumps. The statistical results highlighted both increases in mean scores and decreases in variability, together with large effect sizes. This confirms the practical value of classical dance as a means of improving technique and homogenizing performance levels within a group of young athletes.

From an applied perspective, we recommend the systematic inclusion of ballet exercises in rhythmic gymnastics training plans, in the form of dedicated microcycles adapted to the age category. This integration supports not only the harmonious development of physical and technical components but also the enhancement of artistic expressiveness, thus preparing gymnasts for future competitive performance. Further research, based on larger samples and comparative designs, may validate and extend these conclusions, contributing to the establishment of a modern training methodology in rhythmic gymnastics.

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