The Effects of Plyometric Training In Collegiate Dancer's Jumping Abilities

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Abstract

Introduction: The purpose of this study was to examine whether Plyometric training effects dancers' vertical jump heights and broad jumps, compared to standard jump training activities normally done by dancers. Methods: The six-week study included 14 collegiate leveled dancers, 9 of them (21.3±2.6 years old) completed the plyometric training program while 5 of them (21.5±2.2 years old) completed the dance training program. Each group met twice a week and participated in pretesting and post-testing. Three tests were used to assess the effects of training and included the squat jump, countermovement jump, and broad jump. The first three weeks of training were a series of beginner jumps (80 touches per session) and then the last three weeks progressed to intermediate leveled jumps (100 touches per session). Data was assessed for normality with the Kolmogorov-Smirnov Test, and normally distributed data was assessed using the two-tailed T-test. Non-normally distributed data was assessed with a Mann-Whitney U test and the alpha level used was .05. Results: Improvements in the squat jump were significantly higher in the plyometric group (2.3 inches ± 2.2) compared to the dance group (0.8 inches ± 1.7) ($p<.05$). Improvements in the broad jump were significantly higher in the plyometric group (10.1inches ± 7.2) compared to the dance group (1.8 inches ± 3.8) ($p<.05$). No significant differences between groups were found in the countermovement jump ($p>.05$). Discussion: According to the findings plyometric training increased dancer's jump heights in both the squat jump and broad jump. This suggests that dancers could incorporate a plyometric training program to improve their jumping ability.

Introduction

Dancers practice their jumps repeatedly throughout their training session and the goal is to be able to reach a maximum height to obtain their desired maximum flexibility for that jump. Plyometrics are exercises that cause the muscle to exert maximum force in short periods of time. This type of training uses the stretch-shortening cycle, by having a lengthening movement (eccentric), followed by a quick shortening movement (concentric) (Davies, 2015). For the dancer to jump higher they must be able to generate more explosive power (Adams et al, 1992).The purpose of this study is to assess the effects of Plyometric training on the dancer's jump heights.

Research Question

Does Plyometric training effect dancers' vertical jump heights and broad jumps, compared to standard jump training activities normally done by dancers?

Hypothesis

The plyometric training group will increase vertical jump height in both the squat jump and countermovement jump compared to the control group. There will be no difference for the plyometrics' group broad jump compared to the control group.

Methods

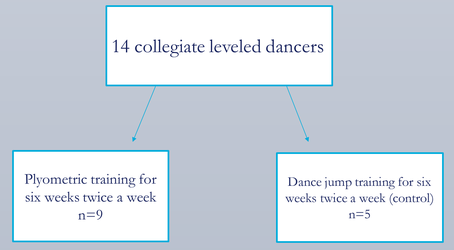


Figure 1. Group design

Testing Battery

Week 1-3: Data collection began on Monday of week one with pretesting of the squat jump, countermovement jump, and broad jump for every individual. Week one also began the first of the three-week beginner training. Each group met twice a week and each session contained 80 touches and a dynamic warm-up.

Week 1-3 Exercises for beginner training for Plyometrics Tuesday/ Thursday	Sets	Repetition
Two-foot ankle hops	2 1	7 6
Double leg vertical jump	2 1	7 6
Standing long jump	2 1	7 6
Power skip	2	5 (on each leg)

Figure 2. Table of beginner exercises for Plyometric group

Week 1-3 Exercises for beginner training for Dance jumps Monday/ Wednesday	Sets	Repetitions
Changement	2 1	7 6
Passé Jump	2	5 (on each leg)
Grand jeté	2	5 (on each leg)
Temps de poisson (fish jump)	2	5 (on each leg)

Figure 3. Table of beginner exercises for Dance group

Week 4-6: Week four began the intermediate training for both groups which met twice a week. Each session for the plyometric group contained 108 touches and a dynamic warm-up. Each session for the dance group contained 100 touches and a dynamic warm-up. Week six contained the last two training sessions for each group and contained post-testing of the squat jump, countermovement jump, and standing long jump for every individual.

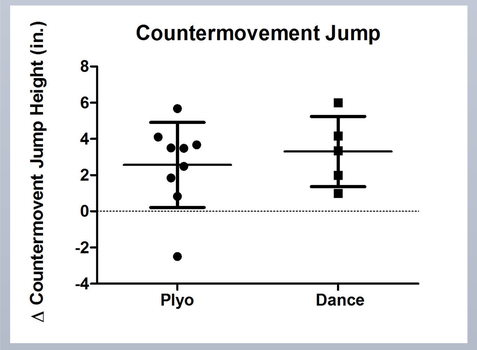
Week 4-6 Exercises for Intermediate training for Plyometric group Tuesday/ Thursday	Sets	Repetitions
Lateral barrier hop	4	6
Split squat jump	2	6 (on each leg)
Jump over barrier	4	6
Single leg ankle hops	2	6 (on each leg)

Figure 4. Table of intermediate exercises for Plyometric group

Week 4-6 Exercises for intermediate training for Dance group Monday/ Wednesday	Sets	Repetitions
Axel turn	2	6 (on each leg)
Single leg axel turn	2	7 (on each leg)
Straddle jump	2	6 (on each leg)
Pas de chat	2	6 (on each leg)

Figures 5. Table of intermediate exercises for Dance group.

Results



Figuure 6. Change in countermovement jump between Plyometric training group and Dance training group. There were no significance found between both groups ($p>0.5$).

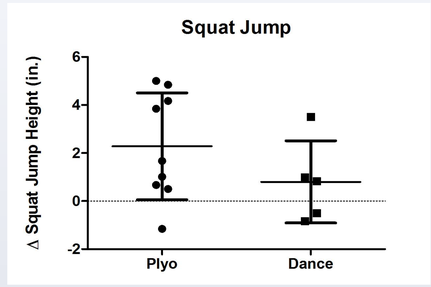
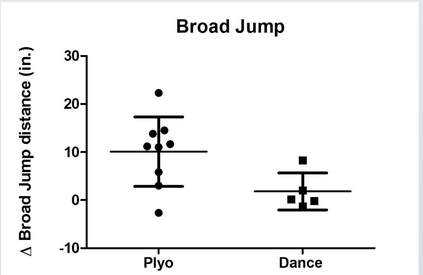


Figure 7. Change in squat jump between the Plyometric training group and Dance training group. The Plyometric group improved by (2.3 inches ± 2.2) compared to the Dance group (0.8 inches ± 1.7) ($p<.05$).

Figure 8. Change in broad jump between Plyometric training group and Dance training group. The Plyometric group improved by 10.1 inches ± 7.2 compared to the Dance group (1.8 inches ± 3.8) ($p<.05$) .



Discussion/Conclusion

Based on the above results improvements in the squat jump and broad jump were significantly higher in the Plyometric group compared to the Dance group. No significant differences between groups were found in the countermovement jump. In conclusion, according to the findings, plyometric training increased dancers jump heights in both the squat jump and broad jump. This suggests that dancers should incorporate a plyometric training program to improve their jumping ability.

What I learned

Throughout this entire experience, I got to learn many things. Some things I learned include how each step of research works and how each step is very different and difficult because I have never gone through these steps on my own for the most part. Trying to get participants that will stick to this demanding schedule and have time slots that work for both parties was extremely difficult. In the beginning, the schedule was perfect and organized, but because everyone had other things going on and could not commit to the original schedule it became a mess, with that being said I was able to make adjustments and finished strong. In this part of data collection though I really enjoyed it and liked to see the research come to life and to be able to see it through was awesome. The step of analyzing and computing the data was difficult because I had to use research language that I don't use all that often. I learned how to think, write, and analyze like a researcher which was such a great experience.

References

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