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## The Repeated Bout Effect for Prevention of Delayed Onset Muscle Soreness in Dancers

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# The Repeated Bout Effect for Prevention of Delayed Onset Muscle Soreness in Dancers



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## Introduction

Dancers use the act of changing their body position in relationship to space to create art. Without muscles, dancing, creating, and expressing themselves would be impossible. Which is why taking care of their muscles is extremely important to dancers. Delayed Onset Muscle Soreness (DOMS) is one of the most common muscular injuries for dancers but can threaten a dancer's career. Determining methods that can minimize DOMS can help dancers avoid further serious injury. This study will look at implementing the Repeated Bout Effect (RBE) to a dancer specific environment.

## Background

Research has shown that eccentric action, or lengthening of the muscle fibers, has the greatest potential for muscular injury and has been connected with injury and DOMS (1). Because dancing involves moving through multiple planes and axes of movement, eccentric movement is an important component of dance. Muscle soreness is described as a type 1 strain, or minor damage and tearing of the muscle fibers (1). DOMS involves the typical symptoms of soreness such as: loss of strength, loss of range of motion (ROM) of the joints, and inflammation of the damaged tissue, but involves more damage and is more severe and sticks around for up to 10 days after the initial activity, with the peak occurring around 48hrs (1,2,). Research has shown that applying a technique known as the Repeated Bout Effect (RBE) can be successful in reducing DOMS in college varsity athletes (2). This technique consists of repeated training sessions with the same or similar movements. Research also supports adding moderate intensity eccentric movements to the warm up as a part of the RBE (4).

## Methods

This study investigated the effect of incorporating similar muscle movements into my warm up and repeating the movement in rehearsal, known as RBE, to reduce muscle damage from DOMS, over the process of learning new movement. ROM was measured through active movement of the hip with the app "Goniometer Records". Soreness was evaluated through a Visual Analog Scale (VAS) and a Numeric Pain Scale (NPS), to reflect procedure used in a study on DOMS conducted by Chen and Nosaka (2006). These measurements were used to define DOMS.

- Subject is a 22 year old female with more than 10 years of dance experience.
- Choreography was created by award-winning choreographer and founder of Abarukas dance company, Yoshito Sakuraba.
- Baseline measurements were recorded before learning the choreography.
- Measurements were repeated 48hrs after when DOMS peaks.
- The movement in the dance was then analyzed for specific eccentric actions.
- 3 moderate intensity eccentric movements that resembled the analyzed movement were put into a 15-minute warm up.
- The rehearsals were spaced 7 days apart in order to provide enough time for the body to heal. The 15-minute warm up with the incorporated eccentric movements was performed prior to rehearsal.
- 48 hours after rehearsal, ROM and PHS score measurements were taken.
- This procedure for rehearsal will be repeated every 7 days until June 6<sup>th</sup>, when the final performance takes place. The data will be analyzed using statistical analysis.

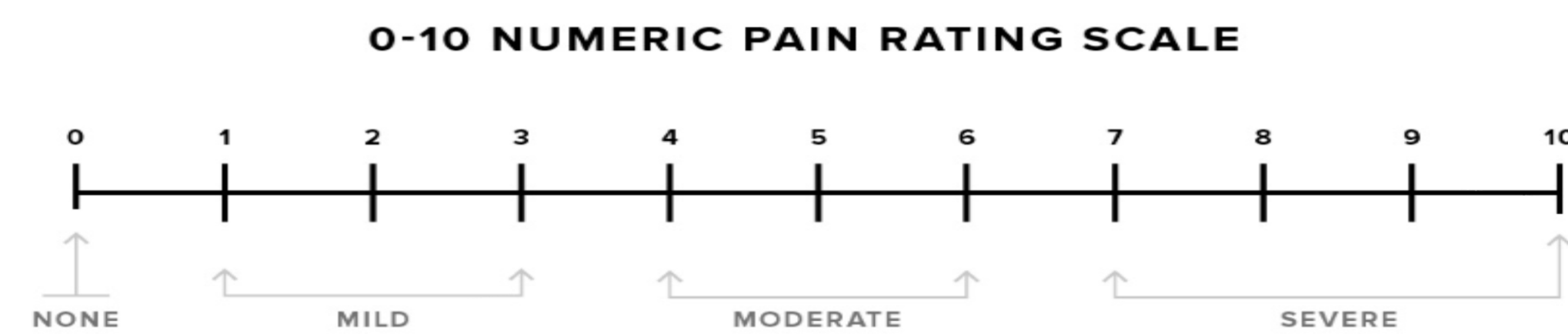


Figure 1: Numeric Pain Scale

Image 1: Still from rehearsal with choreographer Yoshito Sakuraba



## Results

\*preliminary data taken from the first 2 rehearsals. Data collection will be finalized on June 6<sup>th</sup>.

Figure 3: Data collected

Week #	ROM (degrees)	NPS
0	122 degrees	1 (Mild)
1	105 degrees	6 (Severe)
2	102 degrees	8 (Severe)

The data collected from the visual analogue scale was not quantifiable into numbers and acted more as a visual representation of the NPS. Final data collected will be analyzed using ANOVA statistical analysis.

## Summary and Conclusions

There has been a lot of research on DOMS with college athletes, elite runners, cyclists, and people who love to work out at a gym but there isn't a study that specifically looks at the effect on dancers. Through this research, I hope to connect the missing dots research-wise to apply the principals of sports science to a sport that is as much, if not more an art. to learn choreography from award-winning choreographer and founder of Abarukas dance company, Yoshito Sakuraba. The continuing rehearsal process of this piece will allow me to measure how successful the RBE is in preventing DOMS in dancers.

Based off of previously done research on DOMS, the RBE has shown statistically significant results in preventing DOMS (1). The 3 weeks of data collected so far, while too small to draw any conclusions, does appear to represent the initial onset of DOMS. Continuing data collection should start to show results of the effect of RBE, if there any.

Continued study is required to determine the significance of any results of this study. Further research should include a much larger sample size and include a control group.

## References

1. Chen, T. C., Nosaka, K., & Sacco, P. (2007). Intensity of eccentric exercise, shift of optimum angle, and the magnitude of repeated-bout effect. *Journal of Applied Physiology*, 102(3), 992-999. <https://doi.org/10.1152/jappphysiol.00425.2006>
2. Cleary, M. A., Sitler, K. R., & Kendrick, Z. V. (2002). Temporal pattern of the repeated bout effect of eccentric exercise on delayed onset muscle soreness. *Journal of Athletic Training*, 37(1), 32-36.
3. Imtiyaz, S., Veqar, Z., & Shareef, M. Y. (2014). To Compare the Effect of Vibration Therapy and Massage in Prevention of Delayed Onset Muscle Soreness (DOMS). *Journal of Clinical and Diagnostic Research* <https://doi.org/10.7860/jcdr/2014/7294.3971>
4. Law, R. Y. W., & Herbert, R. D. (2007). Warm-up reduces delayed-onset muscle soreness but cool-down does not: a randomized controlled trial. *Australian Journal of Physiotherapy*, 53(2), 91-95. [https://doi.org/10.1016/s0004-9514\(07\)70041-7](https://doi.org/10.1016/s0004-9514(07)70041-7)