
Fitter Dancers Dance Better

The Effects of Supplementary Fitness Training in Contemporary Dance

Manuela Angioi, M.Sc., Ph.D., Centre for Sports and Exercise Medicine, Queen Mary University of London, UK

Within the world of dance medicine and science there is ever-increasing research interest in the benefits of increased physical fitness levels in relation to both performance and injury status. Studies have observed associations between specific physical fitness components, such as muscular power and endurance, and qualitative aspects of dance performance, such as control of movement, spatial skills, accuracy of movement, technique, and dynamics.¹ Nevertheless, these observed associations do not imply causality, meaning that only carefully designed intervention studies will ensure that the observed effect (i.e., dancing better) is a consequence of the increased levels of muscular fitness. The question is: When do we use muscular power and endurance in contemporary dance? Wyon and colleagues reported that simple examples of upper body muscular endurance are in evidence during partner work, when repeatedly lifting and supporting other dancers and/or in transitional movements from floor to stand and vice versa.² Lower body muscular power, on the other hand, is necessary to develop elevation during the take-off phase of any type of jump.

In this study, we developed a combined circuit and vibration training designed to specifically stress the lower body's ability to produce power, and the upper body's muscular endurance as well as the general stamina (aerobic fitness). The overall aim was to ascertain if increased physical fitness levels were reflected in the aesthetic competence level of 24 female contemporary dancers (professionals and students). All 24 dancers were tested for initial levels of lower body muscular power, upper body muscular endurance, and aerobic capacity via some commonly used tests including standing vertical jump, numbers of press-ups performed in one minute, and a dance-specific aerobic fitness test. All dancers also undertook an "aesthetic competence" test, which was developed to objectively score seven aspects of contemporary performance on a scale of 1-10. These included control of movement, spatial skills, accuracy of movement; technique, dynamics, timing, and rhythmical accuracy, performance qualities, and overall performance.¹

In the intervention group (12 dancers), each dancer undertook the combined circuit-vibration training in addition to usual dance training for six weeks; the control group simply carried on with their usual dance training. The training was organized twice a week and each training session lasted approximately one hour, comprising circuit training (CT), 10 minutes rest, and whole-body vibration training (WBV). The CT training consisted of lower and upper body exercises, organized in 10 stations. The 10 exercises included: jumps with feet in parallel position (using a jumping rope), press-ups, bicep curls, triceps extension (with free weights of 0.5 kg each), single leg squat, squats-jumps, *relevés* in first position, *grand-plié* in second position, chest press exercises (with free weights of 0.5 kg each), and plank. Dancers had to exercise for 30 seconds in each station, with 10 seconds of transition time between one station and the other, making the total time for each circuit of six minutes, 50 seconds (including the rest between each station). Dancers had to complete four circuits. The WBV training protocol used six dance-specific static positions on a vibration platform (frequency set at 35 Hz and amplitude at 2.5 mm) including: 1) *plié* with feet in first position; 2) plank (elbow flexed on the floor and feet on platform); 3) lunge (right and left leg on platform?); 4) press up, 90° bend at the elbows; 5) feet in *relevé* with knees slightly bent; and 6) hamstring position, bent over at waist, with knees slightly bent and hamstrings tensed. The training consisted of three sets lasting 40 seconds, with two minutes rest between each set.

While results of the initial tests revealed that all 24 dancers had similar levels of muscular power, endurance, aerobic capacity as well as all scoring similarly in the "aesthetic competence" test, we observed some differences following the six weeks of supplementary fitness training. Specifically, only the dancers who undertook the supplementary training showed increased levels of muscular power, endurance and aerobic capacity as well as higher score results for the performance aesthetic test. The observed increased aerobic levels were attributed to the circuit training, while the in-

creases in muscular power and endurance were considered to be a result of the combined CT and WBV training. The latter in particular has been proven to elicit both concentric and eccentric contractions,³ hence, the enhancement of muscular power. The fact that dancers who did not undertake the fitness training did not improve in the measured fitness components, suggests that dance training is not sufficient enough to overload the energy and musculoskeletal systems and thus to produce physiological adaptations that will enhance each individual fitness component.⁴ The other important aspect of the present study is the link between physical fitness and the artistic elements of dance performance. Not surprisingly, the results of aesthetic competence revealed that dancers who improved their fitness levels scored significantly higher, hence “danced better,” than before undertaking the training. As previously suggested this is because dancers use their bodies as instruments of expression and most common technical skills/movements (jumps, transitory movements, etc.) used in contemporary dance require enhanced fitness levels as well as artistry.¹

What are the implications of such findings for dance teachers? First, the present study contributes to the open debate of whether dancers would benefit from enhanced physical fitness levels equal to other anaerobic athletes. Second, by incorporating supplementary training, dance teachers can help bridge the observed fitness gap between performance preparation (class and rehearsals) and performance periods. Nevertheless, the incorporation of supplementary training into the dancers’ schedules must take into account their present work load, which can already involve six to eight hours a day of exercise at varying intensities. Training sessions need to be scheduled at the end of the day to prevent fatigue from interfering with the high skill ele-

ments of dance. The selection of exercises can be tailored to the choreographic demands, if these are known in advance. The use of WBV training in particular has been shown to provide adaptation of the muscular system with minimal time cost, which is a vital advantage when the daily work time is controlled by unions and the majority of time is focused on artistic training. In conclusion, a six-week supplemental CT and WBV training had a significantly beneficial effect on both physical fitness indices and aesthetic competency for skilled contemporary dancers.

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References

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