Research Review: Zumba: heart rate and back pain under the microscope

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Two recent studies investigate whether Zumba fitness classes can provide workouts that are not only effective, but also safe.

Title: Zumba Gold®: Are The Physiological Responses Sufficient to Improve Fitness in Middle-Age to Older Adults?
Author: Dr's Dalleck, Roos, Byrd and Weatherwax. (Dept of Recreation, Exercise and Sports Science, Western State Colorado University, USA)

Introduction: We’ve been looking for scientific articles on Zumba for quite some time, but until recently couldn’t find any that met our criteria – then late last year we found two. It seems unlikely that you don’t know what Zumba is, but in case that is the situation, here’s a quick overview: it’s a dance fitness program that was developed by a Colombian dancer and choreographer in the 1990s. Zumba consists of dance and aerobic components, which lends itself particularly well to group exercise. The dance elements include hip-hop, mambo, merengue, samba and soca (also known as ‘the soul of calypso’). It is estimated that Zumba is in 180 countries with almost 12 million participants each week. Previous research (Luettgen et al., 2012) has reported that participation in Zumba resulted in a heart rate of approximately 80 per cent of age-predicted heart rate max and an average caloric expenditure of 360 kcals. However, this heart rate intensity may be too high for many mature-aged individuals.

Zumba isn’t just one style of class, however: the focus of this research study is Zumba Gold, a modified form of Zumba that is tailored specifically to mature-aged individuals. Dr Dalleck and his colleagues investigated the cardiometabolic responses of Zumba Gold in this demographic.

Methods: A total of 16 male and female senior participants (average age 64 years) volunteered to participate in this study which involved two visits to an exercise and sports science laboratory. On the first visit participants had height, weight, resting heart rate, maximal heart rate and maximal oxygen consumption (VO₂max) assessed. During the second visit to the laboratory, participants completed a 45-minute Zumba Gold class during which cardiometabolic responses were assessed. The researchers utilised a portable calorimetric device to assess energy expenditure and a Polar telemetry heart rate monitor to assess exercise heart rate response.

Results: The average heart rate response of participants for the 45-minute Zumba Gold class was approximately 114 beats per minute, which corresponded to approximately 50 per cent of the age-predicted heart rate reserve and 50 per cent of the participants’ VO₂max. The participants expended almost 200 kcals of energy in the 45-minute class (4.2 kcals/min for female participants, 5.0 kcals/min for male participants).
The authors concluded that, based upon their findings, Zumba Gold meets the guidelines for improving/maintaining cardiorespiratory fitness. Additionally, the authors state that their results indicate that Zumba Gold was found to be moderate intensity exercise (3 to 6 METS) as it averaged 4.4 METS (range 2.1 to 6.9 METS). The rationale for the importance of determining Zumba Gold as a ‘moderate intensity’ activity is due to the health-related benefits for participants (given high compliance).

Pros: This is a good initial investigation assessing the cardiometabolic response to Zumba Gold in mature-aged participants.

Cons: It would have been beneficial for the researchers to conduct a longitudinal study of 16 weeks and assess participants at week 8 and 16 to determine any improvements in cardiometabolic parameters (VO2max, resting heart rate/blood pressure, lipid (cholesterol) levels).

Title: Is the Zumba fitness responsible for low back pain?

Author: Dr’s Notarnicola, Maccagnano, Pesce, Tafuri, Leo and Moretti. (Orthopedics Section, Department of Basical Medical Sciences, University of Study of Bari, General Hospital, Italy)


Introduction: As fitness professionals we prescribe various modes of exercise for a number of reasons, including health, fitness and social. However, specific modes and/or intensities of exercise may be contraindicated (relative or absolute) depending upon an individual’s limitations (medical and/or musculoskeletal). Furthermore, exercises inherently can induce injury, generally if repetitious, too intense or performed with improper technique.

The Australian Institute of Health and Welfare reports that approximately 14 per cent of the Australian population suffers from back problems, and that 70 to 90 per cent of all Australians will suffer from low back pain in their lifetime.

NSW chiropractors have claimed that Zumba can cause muscle soreness or injury, and that not having good technique can lead to painful sprains, strains and low back pain. Others have also made these claims.

Methods: Dr Notarnicola and colleagues investigated the effects of low back pain in Zumba participants over a six-month period. A total of 50 young, healthy females participated in this study, 25 in the Zumba group (Zumba exercise only) and 25 inactive controls for comparison. All participants completed a disability questionnaire (Roland–Morris), a low back pain disability questionnaire (Oswestry) and a spinal functional sort test (quantifies the ability to perform work tasks that involve the spine and lower extremities).

Results: The inactive group had decreases in physical functioning and the Zumba group had improvement in spine function. There were no differences between groups with regard to episodes of back pain, prompting the authors to conclude that Zumba does not induce back pain.

Pros: A good finding that Zumba does not induce back pain. Zumba may be a suitable ‘moderate intensity’ activity for middle-aged clients and the movements are unlikely to cause back pain.

Cons: The authors reported ‘dropout’ for both groups (three in each group), however they should have also reported compliance, particularly for the Zumba group.

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The 30-second article

- Prompted by previous research findings that participation in regular Zumba classes resulted in a heart rate of approximately 80% HRmax, which may be too high for many older individuals, researchers explored the cardiometabolic responses of Zumba Gold.
- The average heart rate response for the 45-minute Zumba Gold class was approximately 114 beats per minute, which corresponded to approximately 50% of the age-predicted heart rate reserve and 50% of the participants’ VO2max.
- Prompted by anecdotal evidence that participating in Zumba workouts could cause muscle soreness or injury, another group of researchers investigated the effects of low back pain in Zumba practitioners over a six-month period.
- In addition to experiencing no more episodes of back pain than a comparison inactive control group, the Zumba practitioners exhibited an improvement in spine function.