The Effects of Supervised Step Aerobics Training Combined with Daily Milk Consumption on Muscle Power and Cardiovascular Fitness in Inactive Girls: A Randomised Controlled Trial

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Abstract

Background: Physical activity and nutrition are essential for the prevention and treatment of many diseases. This study examined the effects of combining daily milk supplementation and an aerobic exercise routine on physical fitness indicators in adolescent girls.
Methods: The study randomly assigned 83 17-year-old girls into four groups: milk only, exercise only, both milk and exercise, and control groups. The interventions involved drinking 500 mL of low-fat milk daily and engaging in a 1-h step aerobics exercise routine 3 times/week for 12 weeks. VO_{2max}, countermovement jump height and average power, and squat jump height were measured before and after the intervention.
Results: Participants in the combined and exercise only groups had significant improvements in the measured parameters after the intervention compared with participants in the control and milk only groups. No difference in any of the parameters was found between the combined and exercise only groups.
Conclusion: The 12-week step aerobics exercise program had positive effects on muscle power and cardiovascular fitness of adolescent girls, while milk did not provide any additional improvements.

Keywords: Step aerobics, adolescent, maximal oxygen consumption, milk, muscle power

Introduction

The benefits of physical activity and exercise have been consistently acknowledged in a wide range of domains. An exercise frequency of 3 times per week for 20 to 60 min in duration at an intensity of 55–85% of the maximum heart rate is recommended to achieve health-related benefits. [1-3] Despite the known benefits of exercise on health, the physical activity of children and adolescents is not as intense, and many do not meet the recommended guidelines.[4] Step aerobics dance is a physical activity that meets the exercise intensity requirement that triggers health-related benefits, providing sufficient cardiorespiratory demand to enhance aerobic fitness, agility, balance, and muscle strength. [5-7] Moreover, it has been shown to improve the dynamic muscle potential and maximal oxygen consumption in adolescent girls. [8]

Milk consumption contributes large amounts of essential components, such as micronutrients and macronutrients, and should promote general wellness. It has the potential to increase serum levels and decrease deficiencies of micronutrients known to impair growth. [9,10] Moreover, it contains high concentrations of branched-chain amino acids, such as leucine, which are important in the repartitioning of dietary energy from adipose tissue to skeletal muscle.[11]

In sport training, milk is a beneficial supplement for post-exercise recovery. Indeed, chocolate milk is effective at regulating the muscle recovery response, including muscle soreness and fatigue ratings and isometric quadriceps force. [12] Milk also enhances training adaptation by decreasing fat-free tissue mass. [13] However, few studies have examined the effects of daily milk consumption combined with an adequate level of exercise on health-related physical fitness in the inactive population.

Considering results from studies that have illuminated the positive effects of both modalities on many aspects of health, combining both milk and exercise should enhance the benefits when compared with a single modality alone. However, Hashim *et al*. [14] examined the effect of combined milk and exercise on cognitive function in 16-year-old girls and found no additional benefits of milk, although exercise appeared to lead to increased short-term memory.

Therefore, this study investigated the effects of combining daily milk supplementation with an aerobic exercise routine on health-related fitness, including maximal oxygen consumption (VO_{2max}) and lower limb muscle power (countermovement jump and squat jump), in inactive girls. We hypothesised that the combination of milk consumption and aerobic exercise would lead to superior performance compared with the control, exercise only, and milk only groups.

Methods

Participants

The study enrolled 83 17-year-old girls who (1) had no medical problems that would limit daily physical activities, (2) were inactive students who did not participate in regular aerobic exercise programs or any other forms of sports or exercise, and (3) who did not consume milk or dairy products on a regular basis. Signed informed consent was obtained from all participants and their parents/guardians.

Procedures

Study approval was obtained from the Human Ethics Committee of the University of Science, Malaysia, the Ministry of Education, and the principals of the participating schools. Once approval was secured, potential participants were briefed on the study inclusion criteria and the benefits and risks of participation.

There were 222 students at the initial briefing and 185 students requested the information packet that included the consent form. Of these, 125 students returned the consent form with signed parental consent. They were then screened for their (1) level of physical activity, (2) contraindications to exercise, and (3) dairy product consumption to ensure homogeneity of the samples.

These initial screening criteria identified those with a low level of physical activity according to the Physical Activity Questionnaires for adolescents (PAQ-A), not consuming milk on a regular basis based on data from the Food Frequency Questionnaire (FFQ), and with no contraindications to exercise according to their response to the Physical Activity Readiness Questionnaire (PAR-Q). The study excluded 36 students who did not meet these screening criteria.

Experimental procedures

Participants were randomly assigned into either one of three intervention groups (milk only, exercise only, or combined) or the control group. Participants in the milk group were given 250 mL milk in the morning as the first serving and 250 mL in the evening as the second serving for 5 consecutive days per week for 12 weeks. Participants in the exercise group participated in a 1-hour step aerobics dance session 3 times per week for 12 weeks. Participants in the combined group were given milk and exercised the same amount, while those in the control group were instructed to continue with their current levels of activity and diet. All measurements were completed on the same specified day for each group before and after completing the intervention.

Step aerobics dance protocol

Participants who were assigned to the aerobic dance group were required to attend aerobic dance sessions 3 times per week for 1 h per session (from 5:15 to 6:15 pm) for 12 weeks. The protocol was progressively shifted from low- to high-impact movement over the 12 weeks. [15] Each session comprised a 10-min warm-up with stretching and simple rhythmic performance, 45 min of low-impact, high-impact, or step-board movements, and a 5-min cool-down. The instructional choreography included arm and leg coordination, as well as movement in different directions in space. It consisted of basic steps, lunges, lift steps, tap steps, A-steps, L-steps, cross-over jams, and straddles. [16]

The tempo of the music matched the intensity of each session. The warm-up and cool-down tempos were 100–110 beats/min and 120–150 beats/min for the aerobic and step-board movements, respectively, depending on the intensity of the session. [16] Participants were required to follow the movement choreography and their pulse rate was measured immediately after each set at the carotid vein.

The sessions were conducted by two instructors per group. Using a cross-over approach, the instructors alternately led the groups that received this intervention (*i.e*., the exercise only and combined groups). The instructors were given a pre-recorded compact disc of the music according to the intensity and choreography of each session.

Milk supplementation

Commercial low-fat milk was used in this study. The components of this milk per 250 mL are as follows: energy, 113 kcal; protein, 8.0 g; carbohydrate, 11.5 g; fat, 3.8 g; calcium, 338 mg; zinc, 1.0 mg; iodine, 33 µg; vitamin A, 400 µg; vitamin D_3, 6.25 µg; vitamin B_2, 0.33 mg; and vitamin B_{12}, 1.30 µg. The participants consumed 250 mL of milk per serving in the morning and evening daily for 5 days per week for 12 weeks. Program adherence was monitored by a student representative, who was asked to ensure that all participants consumed the milk at the same time. Each day during the intervention time, the milk was delivered to the school by the first author and given directly to the participants or participants' representative.

Measurement procedures

Measurements were made pre- and post-intervention. During the measurement sessions, muscle power and VO_{2max} were measured. A force platform (Quattro jump, type 9290AD; Kistler, Switzerland) was used to measure lower limb muscle power. Data were recorded on a computer connected to a system at a frequency of 500 Hz. Before the test, the subject was familiarised with the measurement protocols. Then, each subject's information (name, birth date, age, sex, weight, and height) was recorded in the device's software. The participants were required to warm-up for at least 10 min before the test and performed a squat jump (SJ) and countermovement jump (CMJ), and the jump height of the SJ (cm) and CMJ (cm), and the average power of the CMG (W/kg) were recorded. Each participant performed 3 jumps with a 1-min rest period between jumps, and the average of the best two trials was included for further analyses.

To perform the CMJ, subjects were asked to start from a static standing position with their hands on their hips for 1~2 seconds, and the jump was performed by flexing their knees to about 90 degrees. They were asked to keep their trunk as vertical as possible and to jump as quickly as possible to the highest point reachable. The participants were to land with normal flexion and stand still in a neutral position for 1~2 seconds.

To perform the SJ, participants were instructed to assume a static position with the knees at an angle of about 90 degrees, the trunk as vertical as possible, and the hands on the waist for 1~2 seconds. They were then asked to jump as quickly as possible to the highest point reachable. The jump was to be performed without any countermovement, and they were to land in normal flexion and stand still in neutral position for 1~2 seconds.

The Rockport test was used to estimate VO_{2max}.[17] Participants were asked to walk as quickly as possible for 1 mile on a level surface at a steady pace. Immediately at the end of the walk, the participant's heart rate and finishing time were recorded by the researcher. VO_{2max} was estimated using the following equation:

$$\text{Peak } VO_{2max}\ (mL\cdot kg^{-1}\cdot min^{-1}) = 132.853 - [0.0769 \times \text{weight (kg)}] - [0.3877 \times \text{age (years)}] \neq [6.3150 \times \text{gender}^{\#}] - [3.2649 \times \text{time (min)}] - [0.1565 \times \text{HR (bpm)}]$$

Statistical analysis

The Kolmogorov–Smirnov test was used to examine the normality assumption, and a 4 (groups) × 2 (time) analysis of variance (ANOVA) was used to analyse differences among groups across measurement sessions. When the homogeneity assumption was violated, the Greenhouse–Geisser value was used for the corrected values of the degrees of freedom for the within-subject factor. The level of significance was set at $p < 0.05$. Data analysis was performed using SPSS ver. 19.

Results

A significant time × group interaction was found for CMJ (jump height) ($F = 1.31$, df = 3.74, $P < 0.05$), CMJ (average power) ($F = 2.05$, 5.05, $P < 0.05$), SJ (jump height) ($F = 1.34$, df = 4.35, $P < 0.05$), and VO_{2max} ($F = 11.48$, df = 6, $P < 0.001$). *Post hoc* analysis was performed to examine pairwise differences. Detailed results are presented in Tables 2 and 3. The exercise only and combined groups performed significantly better than the milk only and control groups post-intervention, while no difference was observed between the exercise only and combined groups.

Discussion

This study revealed the beneficial effects of step aerobics exercise on muscle power and VO_{2max}. Our findings are in accordance with the literature regarding the effects of aerobic dance training on measures of muscle functions.[5-7, 18,19] It has been suggested that growth hormone is secreted when exercise is conducted at > 50% of VO_{2max}.[20] Although not measured directly, the intensity of the aerobic training, which was 60~80% of VO_{2max}, may be adequate to induce growth hormone secretion, which may affect skeletal muscle mass, strength, and fibre composition, as observed in this study. Indeed, exercise intensity influences motor-unit activation, with high-intensity training activating both slow- and fast-twitch fibres.[21] Consequently, the stepping exercise intensity of 60~80% of VO_{2max} may have promoted significant muscle power improvement after the 12-week intervention.

Few studies have examined the effects of milk supplementation on enhancing the effects of step aerobics exercise on muscle power or strength. Kukuljan *et al*.[22] reported that daily consumption of 400 mL of low-fat milk fortified with additional energy, protein, vitamin D_3, and calcium did not contribute to the effects of 12 weeks of resistance training (3 times/week, 60 min/session) on muscle mass, strength, or function in healthy adults. By contrast, the findings of a 12-week intervention in healthy young male weightlifters revealed that milk consumption immediately and 1 h after exercise led to significantly increased lean mass compared with soy or carbohydrate consumption. [23]

It is difficult to compare our study with the above-mentioned studies due to the types of exercise and the timing of milk consumption. Indeed, the timing at which milk was consumed tended to produce different effects. For example, the lack of a non-significant effect in Kukuljan *et al*. [22] was attributed to the timing at which the fortified milk was consumed. They stated that the timing of milk consumption in relation to the exercise program was not controlled, and therefore it was possible that the participants may have missed the important anabolic opportunity to enhance muscle protein synthesis. Esmarck *et al*. [24] reported that protein delivery immediately after each session of resistance training augmented the exercise-induced gains in muscle hypertrophy compared with consuming it 2 h later. In this regard, Cribb and Hayes [25] revealed that the consumption of protein and creatine supplementation immediately before and after each exercise training session led to significantly greater skeletal muscle gains compared with the group that consumed the supplement outside of the pre- and post-exercise time settings. In comparison, in our study, one serving of milk supplementation was consumed in the morning and another serving in the evening; the latter was not immediately after the aerobic exercise. This is another possible reason for the non-effectiveness of milk supplementation in terms of muscle power and muscle mass improvement induced with step aerobics exercise.

Two main limitations need to be considered when interpreting the study findings. First, this study was a quasi-experimental study, which involved uncontrolled environments that could potentially affect the results. Specifically, additional activities of the participants during the intervention period were not controlled. Second, although all participants lived in a hostel and consumed similar diets, we were not able to control for extra food that might have been consumed outside of the school setting.

Conclusion

In conclusion, the 12-week step aerobics dance program performed 3 times/week led to improved physical fitness. Since adolescent girls are at particular risk of becoming physically inactive, step aerobics dance training with music may serve as a moderate- to high-intensity group-fitness training approach to achieve greater physical activity in this population. Adding 500 mL/day of milk supplementation to step aerobics exercise had no additional effect on physical fitness.

References

1. Fletcher GF, Balady G, Blair SN, Blumenthal J, Caspersen C, Chaitman B, Epstein S, Froelicher ESS, Froelicher VF, Pina IL. Statement on exercise: Benefits and recommendations for physical activity programs for all Americans a statement for health professionals by the committee on exercise and cardiac rehabilitation of the council on clinical cardiology, American Heart Association. *Circulation*. 1996; 94(4): 857-862.

2. Wenger HA, Bell GJ. The interactions of intensity, frequency and duration of exercise training in altering cardiorespiratory fitness. *Sports Med.* 1986; 3(5): 346-356.

3. Gossard D, Haskell WL, Taylor CB, Mueller JK, Rogers F, Chandler M, Ahn DK, Miller NH, DeBusk RF. Effects of low-and high-intensity home-based exercise training on functional capacity in healthy middle-aged men. *Am J Cardiol.* 1986; 57(6): 446-449.

4. Hashim HA, Rosmatunisah A, Freddy G. Profiles of exercise motivation, physical activity, exercise habit, and academic performance in Malaysian adolescents: A cluster analysis. *IJCRIMPH*. 2011; 3(6): 416-428.

5. Shigematsu R, Chang M, Yabushita N, Sakai T, Nakagaichi M, Nho H, Tanaka K. Dance-based aerobic exercise may improve indices of falling risk in older women. *Age*. 2002; 31(4): 261-266.

6. Olson MS, Williford HN, Blessing DL, Greathouse R. The cardiovascular and metabolic effects of bench stepping exercise in females. *Med Sci Sport Exer.* 1991; 23(11): 1311-1317.

7. Sherrington C, Lord SR. Home exercise to improve strength and walking velocity after hip fracture: a randomized controlled trial. *Arch Phys Med Rehab*. 1997; 78(2): 208-212.

8. Mandarić S. Effects of programmed exercising to music of female pupils. *Phys Educ Sports.* 2001; 1(8): 37-49.

9. Neumann C, Harris DM, Rogers LM. Contribution of animal source foods in improving diet quality and function in children in the developing world. *Nutr Res.* 2002; 22(1): 193-220.

10. Miller GD, Jarvis JK, McBean LD. The importance of meeting calcium needs with foods. *J Am Coll Nutr.* 2001; 20(2): 168S-185S.

11. Weaver CM, Campbell WW, Teegarden D, Craig BA, Martin BR, Singh R, Braun MM, Apolzan JW, Hannon TS, Schoeller DA. Calcium, dairy products, and energy balance in overweight adolescents: a controlled trial. *Am J Clin Nutr.* 2011; 94(5): 1163-1170.

12. Gilson SF, Saunders MJ, Moran CW, Corriere DF, Moore RW, Womack CJ, Todd MK. Effects of chocolate milk consumption on markers of muscle recovery during intensified soccer training. *Med Sci Sport Exer.* 2009; 41(5): 508.

13. Rankin JW, Goldman LP, Puglisi MJ, Nickols-Richardson SM, Earthman CP, Gwazdauskas FC. Effect of post-exercise supplement consumption on adaptations to resistance training. *J Am Coll Nutr.* 2004; 23(4): 322-330.

14. Leong IT, Moghadam S, Hashim HA. Aggregated effects of combining daily milk consumption and aerobic exercise on short-term memory and sustained attention among female students. *Percept Motor Skill.* 2015; 120(1): 57-66.

15. Robergs RA, Roberts S. Exercise physiology: exercise, performance, and clinical applications. Mosby St. Louis; 1997.

16. Kostić R, Đurašković R, Miletić Đ, Mikalački M. Changes in the cardiovascular fitness and body composition of women under the influence of the aerobic dance. Facta universitatis-series: *Phys Educ Sports*. 2006; 4(1): 59-71.

17. Kolkhorst FW, Buono Mj. Virual exercise physiology elaborator. Victor Graphics; 2004. p. 137-138.

18. Kravitz L, Cisar CJ, Christensen CL, Setterlund SS. The physiological effects of step training with and without hand weights. *J Sport Med Phys Fit*. 1993; 33(4): 348-358.

19. Kraemer WJ, Keuning M, Ratamess NA, Volek JS. McCormick M, Bush JA, Nindl BC, Gordon SE, Mazzetti SA, Newton RU. Resistance training combined with bench-step aerobics enhances women's health profile. *Med Sci Sport Exer.* 2001; 33(2): 259-269.

20. Sutton JR. Hormonal and metabolic responses to exercise in subject of high and low work capacities. *Med Sci Sports.* 1978; 10:1–6.

21. Sale DG. Influence of exercise and training on motor uniactivation. *Exerc Sport Sci Rev.* 1987; 15: 95–151.

22. Kukuljan S, Nowson C, Bass S, Sanders K, Nicholson G, Seibel M, Salmon J, Daly R. Effects of a multi-component exercise program and calcium–vitamin-D3-fortified milk on bone mineral density in older men: a randomised controlled trial. *Osteoporosis Int*. 2009; 20(7): 1241-1251.

23. Hartman JW, Tang JE, Wilkinson SB, Tarnopolsky MA, Lawrence RL, Fullerton AV, Phillips S M. Consumption of fat-free fluid milk after resistance exercise promotes greater lean mass accretion than does consumption of soy or carbohydrate in young, novice, male weightlifters. *Am J Clin Nutr.* 2007; 86(2): 373-381.

24. Esmarck B, Andersen J, Olsen S, Richter EA, Mizuno M, Kjær M. Timing of post exercise protein intake is important for muscle hypertrophy with resistance training in elderly humans. *J Physiol.* 2001; 535(1): 301-311.

25. Cribb PJ, Hayes A. Effects of Supplement-Timing and Resistance Exercise on Skeletal Muscle Hypertrophy. *Med Sci Sport Exer*. 2006; 38(11): 1918-1925.

Table 1. Means and S.D. values for measured parameters in the four experimental groups across the experimental trial.

Variables	Groups							
	Milk (N = 23)		Combined (N =18)		Exercise (N = 22)		Control (N = 20)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
$VO2_{max}$	35.01 (5.25)	36.39 (3.39)	37.29 (3.58)	44.38 (4.45)	36.44 (2.92)	42.47 (2.76)	35.09 (4.14)	34.07 (4.72)
CMJ (jump height)	26.70 (3.95)	26.81 (5.98)	26.06 (5.29)	29.80 (2.54)	27.21 (3.26)	30.15 (3.74)	23.05 (11.32)	23.50 (4.44)
CMJ (power average)	18.82 (2.46)	19.89 (3.55)	18.47 (2.23)	21.45 1.81)	19.54 (3.49)	21.86 (2.41)	17.74 (3.12)	18.55 (2.77)
SJ (Jump height)	31.82 (5.54)	32.82 (4.39)	31.40 (5.73)	33.37 (6.19)	30.82 (3.41)	34.58 (4.42)	29.38 (6.68)	29.75 (3.93)

Notes. CMJ = Counter Movement Jump, SJ = Squat Jump.

Table 2. Pair Wise Comparisons on VO2max Across the Measurement Sessions

Measurement Sessions	Groups		Mean Difference	SE	P value	95% Confidence Interval for Difference	
						Lower Bound	Upper Bound
Baseline measurement	Control	Milk	0.07	1.40	0.95	-2.73	2.88
	Control	Combined	-2.21	1.40	0.12	-5.01	0.60
	Control	Exercise	-1.36	1.40	0.33	-4.16	1.45
	Milk	Combined	-2.28	1.43	0.00	-7.07	0.57
	Milk	Exercise	-1.43	1.43	0.01	-6.29	1.42
	Exercise	Combined	-0.85	1.42	0.58	-3.59	2.00
	Exercise	Combined	-0.78	1.41	0.58	-3.59	2.04
Post measurement	Control	Milk	-2.32	1.34	0.08	-4.99	0.35
	Control	Combined	-10.31	1.34	0.00***	-12.99	-7.64
	Control	Exercise	-8.40	1.34	0.00***	-11.07	-5.73
	Milk	Combined	-7.99	1.36	0.00***	-10.70	-5.28
	Milk	Exercise	-6.08	1.36	0.00***	-8.79	-3.37
	Exercise	Combined	-1.91	1.36	0.16	-4.62	0.80

$^{***}P < 0.001$

Table 3. Pair Wise Comparisons of Muscular Power Across the Measurement Sessions

Measurement Sessions	Groups		Mean Difference	SE	P value	95% Confidence Interval for Difference	
						Lower Bound	UpperBound
CMJ (jump height)							
Baseline measurement	Control	Milk	-1.65	2.39	0.49	-6.43	3.11
	Control	Combined	-1.01	2.38	0.67	-5.78	3.76
	Control	Exercise	-2.16	2.38	0.37	-6.93	2.61
	Milk	Combined	0.65	2.45	0.79	-4.26	2.51
	Milk	Exercise	-0.50	2.45	0.83	-5.41	0.51
	Exercise	Combined	1.15	2.46	0.64	-3.76	5.21
Post measurement	Control	Milk	-2.67	1.49	0.07	-5.67	0.32
	Control	Combined	-6.06	1.49	0.00***	-9.06	-3.07
	Control	Exercise	-6.64	1.49	0.00***	-9.64	-3.64
	Milk	Combined	-3.39	1.54	0.03*	-6.47	-0.31
	Milk	Exercise	-3.96	1.54	0.01*	-7.05	-0.88
	Exercise	Combined	0.57	1.54	0.71	-2.50	3.65
CMJ power average							
Baseline measurement	Control	Milk	-1.08	0.99	0.27	-3.05	0.89
	Control	Combined	-0.72	0.98	0.46	-2.70	1.25
	Control	Exercise	-1.79	0.98	0.07	-3.77	0.17
	Milk	Combined	0.35	1.02	0.72	-1.68	2.39
	Milk	Exercise	-0.72	1.02	0.48	-2.75	1.31
	Exercise	Combined	1.07	1.02	0.29	-0.96	3.11
Post measurement	Control	Milk	-1.34	0.98	0.17	-3.31	0.63
	Control	Combined	-2.90	0.98	0.00***	-4.88	-0.93
	Control	Exercise	-3.31	0.91	0.00**	-5.14	-1.48
	Milk	Combined	-2.03	0.99	0.03*	-4.03	-0.03
	Milk	Exercise	-1.97	0.94	0.04*	-3.85	-0.09
	Exercise	Combined	-0.50	1.01	0.62	-2.53	1.52
SJ (jump height)							
Baseline measurement	Control	Milk	-2.44	1.89	0.20	-6.23	1.35
	Control	Combined	-2.02	1.89	0.29	-5.81	1.7
	Control	Exercise	-1.44	1.89	0.45	-5.23	2.35
	Milk	Combined	0.42	1.95	0.83	-3.48	4.32
	Milk	Exercise	1.00	1.95	0.61	-2.90	4.90
	Exercise	Combined	-0.58	1.95	0.76	-4.48	3.32
Post measurement	Control	Milk	-3.16	1.64	0.05	-6.45	0.12
	Control	Combined	-4.62	1.64	0.03**	-6.91	-0.33
	Control	Exercise	-3.83	1.64	0.00*	-8.11	-1.54
	Milk	Combined	-3.45	1.69	0.04**	-3.84	-2.92
	Milk	Exercise	-2.66	1.69	0.00*	-5.04	-1.72
	Exercise	Combined	1.21	1.69	0.47	-2.17	4.59