COMBINED EFFECT OF CHOCOLATE MILK WITH PHYSICAL EXERCISE ON SELECTED PHYSIOLOGICAL PARAMETERS AMONG COLLEGE MALE STUDENTS

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Abstract

Purpose: The purpose of this study is to examine the combined effect of chocolate milk with physical exercise on selected psychological variables among college male students. At this end of the investigation, we tested the effects of commercially-available drinks on Resting heart rate and VO_2 max in afield-based experiment with male participants.
Methods: The study has secured the participation of 45 male participants in total. The physiological factors that were investigated in these studies were resting heart rate and VO_2max. The experimental group-I (PECMG) were encouraged to have chocolate milk following the prescribed exercise, whereas the experimental group II (PEG) was instructed to just perform the required exercise.
Results: Measures of ANCOVA showed there was a significant difference on Resting heart rate and VO_2max score between groups. Among all three groups (PECMG vs PEG vs CG) chocolate milk with physical exercise group shows good improvement.
Conclusion: The impact of chocolate milk on Resting heart rate and VO_2max was more effective. Experiments with more participants and longer experiment days will provide conclusive proof in future studies. Regardless of whether they drink chocolate milk or not, exercise is important for good health. Sports performance is enhanced by exercise and chocolate milk.

Keywords*: Exercise supplements, Chocolate milk, Resting heart rate and VO_2 max.*

INTRODUCTION

Chocolate milk's combination of carbohydrates and high-quality protein first made researchers take notice of a potential exercise benefit. The combination of carbs and protein already in chocolate milk matched the ratio found to be most beneficial for recovery. In fact, studies suggest that chocolate milk has the right mix of carbs and protein to help refuel exhausted muscles, and the protein in milk helps build lean muscle. This new research adds to a growing body of evidence suggesting milk can be just as effective as some commercial sports drinks in helping athletes refuel and recover. Milk also provides fluids for rehydration and electrolytes, including potassium, calcium and magnesium lost in sweat, that both recreational exercisers and elite athletes need to replace after strenuous activity. Plus, chocolate milk is naturally nutrient-rich with the advantage of additional nutrients not found in most traditional sports drinks. Penny-for-penny, no other post-exercise drink contains the full range of vitamins and minerals found in chocolate milk.

Athletes drink lower - fat chocolate milk after a workout to help muscles recover

rapidly andreplenish what the body loses during rigorous activity, such as water, vital nutrients, and electrolytes (calcium, potassium, sodium, and magnesium) lost through perspiration. Low fat chocolate milk has the ideal amount of carbohydrates and protein to help replenish tired muscles, according to science (McCleave, 2011). When compared to consuming a carb-only beverage as part of a normal training and recovery programme, milk and milk protein have been found to help athletes grow more lean muscle and lose fat (Hartman, 2007). In a 12-week training programme, healthy, untrained males who drank fat free milk after exercise grew more muscle and burned more body fat than those who drank a soyprotein beverage or a carb-only beverage. The calories for all three beverages were the same. (Josse, 2010).

Each 8-ounce glass of low fat chocolate milk has 8g of high-quality protein, which helpsmuscles repair and rebuild after strenuous activity. According to research, those who workedout hard and then drank plain or flavoured milk afterward had less exercise-induced muscledamage than those who drank regular sports drinks or water (Lunn, 2010; Lunn, 2012; Karp, 2006). In one study, post-exercise muscle biopsies in eight moderately trained male runners found that drinking 16 ounces of fat free chocolate milk boosted skeletal muscle protein synthesis as compared to ingesting the same number of calories in a carbohydrate-only sports beverage. This enhancement shows that muscles' ability to repair and replenish has improved (Karp, 2006).

Experts agree that the two-hour window after exercise is an important, yet often neglected, part of a fitness routine. After strenuous exercise, this post-workout recovery period is critical for active people at all fitness levels – to help make the most of a workout and stay in top shape for the next workout. The new research suggests that drinking fat free chocolate milk after exercise can help the body retain, replenish and rebuild muscle to help your body recover. Drinking low fat chocolate milk after a strenuous workout could even help prep muscles to perform better in a subsequent bout of exercise.

METHODOLOGY

Participants

When the researcher presented his findings, participants were sourced from the Department of Physical Education at Annamalai University in Chidambaram. For this investigation, 45 volunteers were accepted. None of the volunteers for this study have any lactose intolerance. Before the experiments started, the study was explained in this section of the participants. The contestants' ages vary from 18 to 23 years. Every participant gave written consent before to the study's start.

Protocol

To achieve the study's objective, all 45 participants were asked to arrive in the morning

at Play field for the first day of training. All participants are asked to wear clothing that is suited for activity. The researcher explained the studies and the procedure for conducting the test and training the participants had all been gathered. Only the resting heart rate and VO_2max were examined using the standard testing procedures. Each group's 15 members were chosen at random from those three groups. The volunteers were instructed to complete the pre test after segregating the group. The control group was instructed to resume their regular activities after completing the resting heart rate and VO_2Max, whereas the other two experimental group participants were required to complete the specified physical activity. Both the experimental group I (PECMG) and the experimental group II group (PEG) were given the same physical activity instructions, with the exception that the experimental group I (PECMG) was instructed to consume chocolate milk.

Statistical Techniques

The data was analyzed by the application of the analysis of covariance. Whenever the adjusted post-test means were found significant, the Scheffe's post-hoc test was administer to find out the paired means difference. To test the obtained results the level of significance 0.05 was chosen.

Collection of Data

For this experiment, two tests would be conducted in order to obtain the necessary data. The first was taken before the activity began, and the second was taken 12 weeks afterwards.

RESULTS

The pre and post test data collected on resting heart rate was statistically analyzed by ANCOVA and the results are given in table I.

Table-I: Computation of Analysis of Co-Variance on Resting Heart Rate

Pretest Mean			Posttest Mean			Adjusted post test means			Sources of Variance	Sum of square	df	Mean square	F ratio
CG	PEG	PECMG	CG	PEG	PECMG	CG	PEG	PECMG					
71.53 ± 4.84	74.33 ±5.02	75.14 ±4.52	71.47 ± 4.97	68.93 ±4.56	67.20 ±3.15	71.84	68.82	66.94	Between	78.73	2	39.39	15.12*
									Within	106.74	41	2.6	

***CG**–Control Group, **PEG**– Physical Exercise Group, **PECMG**–Physical Exercise with Chocolate Milk Group*
**Significant at 0.05 level of confidence (The table value required for significance at 0.05 level with df 2 and 41is 3.23)*

Table -I shows the pre test mean of Control Group, Physical Exercise Group and Physical Exercise with Chocolate Milk Group are 71.53, 74.33 and 75.14 respectively and the post mean of Control Group, Physical Exercise Group and Physical Exercise with Chocolate Milk Group are 71.47, 68.93 and 67.20 respectively. The adjusted post test means of Control Group, Physical exercise Group and Physical Exercise with Chocolate Milk

Group are 71.84, 68.82 and 66.94 respectively. The obtained f-ratio of 15.12 which is higher than the table value 3.23 with df 2 and 41 required for significance. The result of the study indicates that there are significant mean differences on resting heart rate among the adjusted posttest means of Control Group, Physical Exercise Group and Physical Exercise with Chocolate Milk Group at 0.05 level.

The Scheffe's post-hoc test was administer to find out the paired means difference and the results are given in table II.

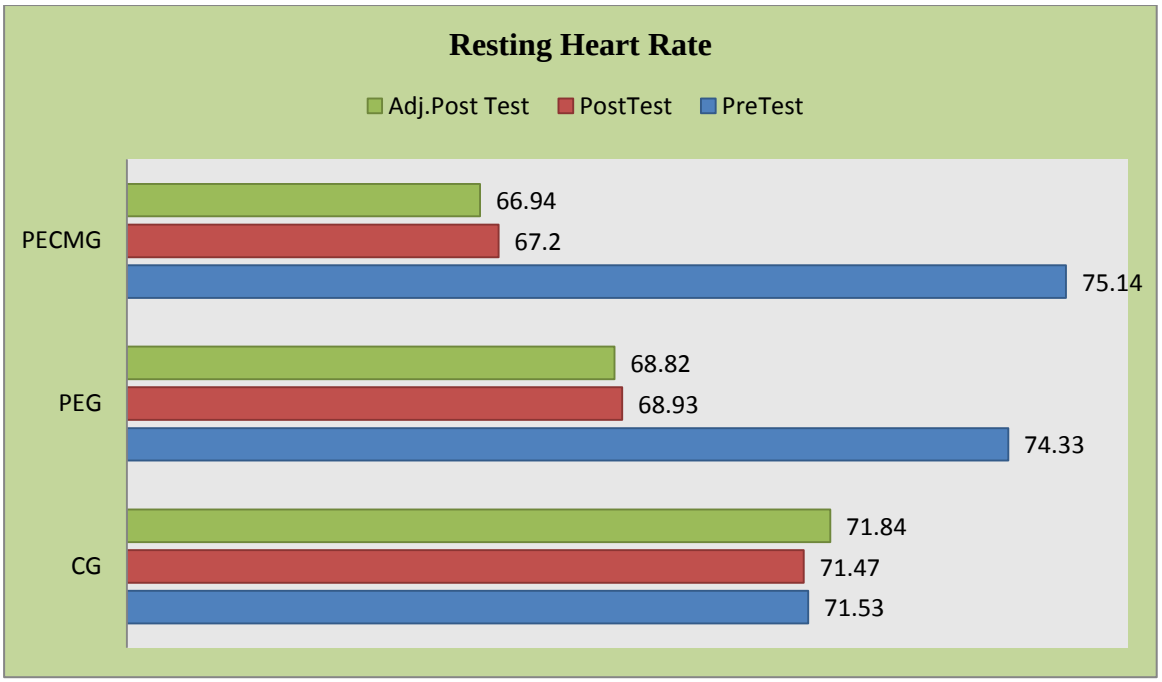
Table-II: Scheffe's Post Hoc Test on Heart Rate

Physical Exercise with Chocolate Milk Group	Physical Exercise Group	Control Group	Mean Difference	Confidence interval
66.94	68.82		1.88*	1.49
66.94		71.84	4.90*	
	68.82	71.84	3.02*	

**significant at .05 level*

Table -II shows that the adjusted post test mean differences in Heart rate between Physical Exercise with Chocolate Milk Group and Physical Exercise Group is 1.88 and Physical Exercise with Chocolate Milk and Control group is 4.90, Physical Exercise Group and Control Group is 3.02 which are greater than the confidence interval value of which is 1.49 statistically significant at 0.05 level of confidence.

Figure–1: Pre and Post mean values and adjusted post mean values of resting heart rate on physical exercise with chocolate milk group, physical exercise group and control group.



The pre and post test data collected on VO_2 max were statistically analyzed by ANCOVA and the results are given in table III.

Table-III: Computation of Analysis of Co-Variance onVO_2max

Pre test Mean			Post test Mean			Adjusted post test means			Sources of Variance	Sum of square	df	Mean squares	F ratio
CG	PEG	PECMG	CG	PEG	PECMG	CG	PEG	PECMG					
38.86 ± 2.44	38.80 ± 2.30	38.14 ±2.16	38.07 ±2.08	50.40 ±1.42	53.93 ±3.15	39.12	50.37	53.89	Between	1770.94	2	885.47	104.88
									Within	346.15	41	8.44	

***CG**–Control Group, **PEG**– Physical Exercise Group, **PECMG**–Physical Exercise with Chocolate Milk Group*
**Significant at0.05 level of confidence (The table value required for significance at 0.05 level with df 2 and 41 is 3.23)*

Table -III shows the pre test mean of Control Group, Physical Exercise Group and Physical Exercise with Chocolate Milk Group are 38.86, 38.80 and 38.14 respectively and the post mean of Control Group, Physical Exercise Group and Physical Exercise with Chocolate Milk Group are 38.07, 50.40 and 53.93 respectively. The adjusted post test means of Control Group, Physical exercise Group and Physical Exercise with Chocolate Milk Group are 39.12,50.37 and 53.89 respectively. The obtained f-ratio of 104.88 which is higher than the table value 3.23 with df 2 and 41 required for significance. The result of the study indicates that there are significant mean differences on VO_2 max among the adjusted post test means of Control Group, Physical Exercise Group and Physical Exercise with Chocolate Milk Group at 0.05 level. The Scheffe's post-hoc test was administer to find out the paired means difference and the results are given in table IV.

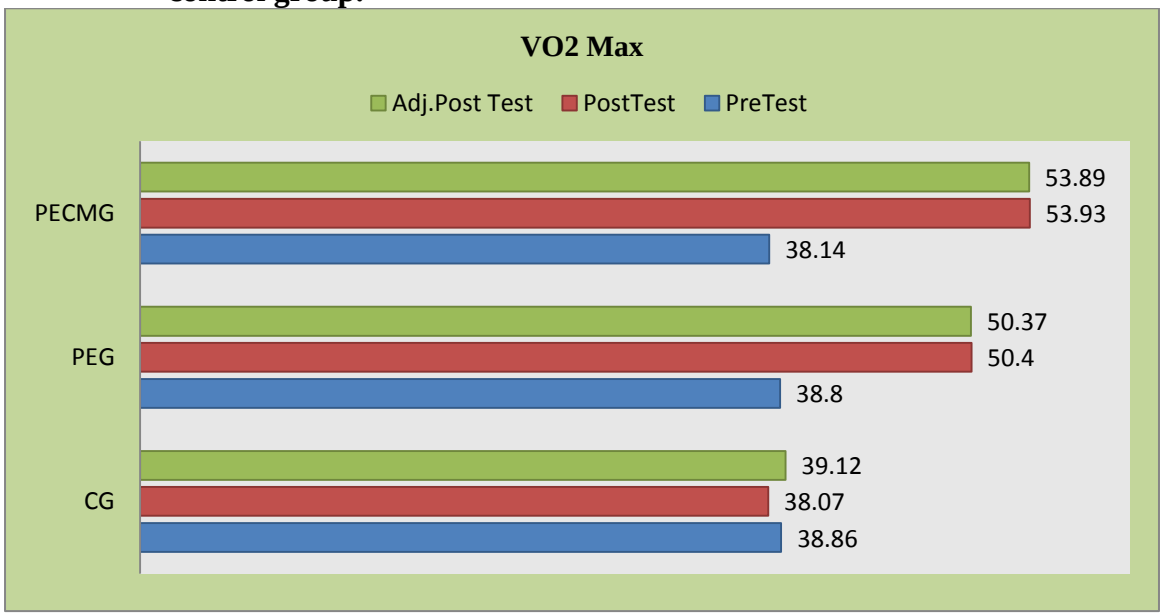
Table-IV: Scheffe's Post Hoc Test on VO2 Max

Physical Exercise with Chocolate Milk Group	Physical Exercise Group	Control Group	Mean Difference	Confidence interval
53.89	50.37		3.52*	2.69
53.89		39.12	14.77*	
	50.37	39.12	11.25*	

**significant at .05 level*

Table IV shows that the adjusted post test mean differences in VO_2Max between Physical Exercise with Chocolate Milk Group and Physical Exercise Group is 3.52 and Physical Exercise with Chocolate Milk and Control group is 1.09, Physical Exercise Group and Control Group is 1.68 which are greater than the confidence interval value of which is 3.42 statistically significant at 0.05 level of confidence. Hence it is clear that the Physical Exercise Group and Physical Exercise with Chocolate Milk Group significantly difference on VO_2max of the Participants. Among this two training groups Physical Exercise with Chocolate Milk Group seems to be the best.

Figure – 2: Pre and Post mean values and adjusted post mean values of VO2 max on physical exercise with chocolate milk group, physical exercise group and control group.



Discussion

Regular aerobic exercise is a well-proven strategy to increase $V\dot{O}_2max$ and endurance performance (Milanovic, Sporis & Weston, 2015), changes underpinned by improved cardiac output and mitochondrial function and vascularity within skeletal muscle tissue (Lavie et al., 2019). In addition, the degree of exercise-induced adaptations can be influenced by nutritional factors such as protein intake (Hawley et al., 2011). Indeed, some research (Ferguson-Stegall et al., 2011; Knuiman et al., 2019) has shown further improvements in $V\dot{O}2max$ following 4.5–12 weeks of post-exercise supplementation.

Ferguson-Stegall and colleagues (Ferguson-Stegall et al., 2011) found a significant difference in $V\dot{O}2max$ improvement, in normal weight untrained participants following protein-carbohydrate supplementation compared to a placebo control and a carbohydrate only drink. Regarding the mechanism underpinning the cardiovascular improvement, may be an increase in plasma volume could have been achieved by a greater increase in plasma albumin content.

Conclusion:

Analysis of Co-variance (ANCOVA) measurements revealed a significant difference between groups in both the resting heart rate and VO_2max scores. The chocolate milk and

exercise group (PECMG vs. PEG vs.CG) improves well compared to the other two groups. Chocolate milk had a stronger influence on heart rate and VO_2max variables. Future research will be able to give definitive confirmation from experiments with more participants and longer experiment days. Exercise is necessary for optimum health whether or not we consume chocolate milk. Exercise and chocolate milk help athletes perform better.

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