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DIFFERENT TIMES OF THE DAY AND RECOVERY OF HEART RATE AND RESPIRATORY RATE AFTER WORKOUT – A COMPARISON

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Short Profile

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ABSTRACT:
This study was done to compare the amount of recovery at different times of the day i.e. Morning, Afternoon and Evening. The researcher has selected a total of five subjects purposively with the age 19±2 years from Jiwaji University, Gwalior. The heart rate and respiratory rate were recorded just after the finish of the specific anaerobic workout and after fixed regular subsequent intervals. The recovered heart rate and respiratory rate (from the reserved) were compared with the help of one way analysis of variance. No significant differences were found in the amount of recovery at different times of the day in heart rate and respiratory rate.

KEYWORDS
Recovery, Heart Rate, Respiratory rate, Floor Exercise.

INTRODUCTION:

During the competitive phase of the season, gymnasts usually repeat their six events several times per practice session. Lechevalier et al., (1999) found high BL values in young high-level gymnasts performing their routines twice. These types of practices are similar to interval training due to the intermittent and intense activities that are involved. It is generally observed that few gymnastic coaches use active recovery between routine repetitions. Research on exercise and time of day is growing, but still limited and not without controversy. Everyone has their preferences and ideas as to when be the best time to exercise. Some like to train in the morning and starting the day with a good workout, others squeeze in their training sessions around lunchtime while most tend to train after work in the late evening or at night. The question remains, however, when the best time to train is? While the science of how our body works indicates that late afternoon workouts are usually best for optimum performance, the adaptive nature of our bodies are such that we can learn to operate at peak efficiencies at almost any time of the day by training ourselves to do so. Therefore in this study the researcher has made an attempt to find out the recovery responses of gymnast at selected daytimes.

METHODS

Selection of Subjects

The purpose of the study was to find out that which time of day-either morning, afternoon or evening, results in quicker recovery in gymnasts after specific anaerobic workout.

For this purpose of the study all 5 male University level gymnasts available at Jiwaji University, Gwalior were selected through purposive sampling. The age of subjects was 19±2 years. All the subjects residing in campus of Jiwaji University, Gwalior were selected for the study.

Selection of Variables and Tests

Keeping in mind the feasibility criteria and the specific purpose of the present investigation, the below mentioned variables were found appropriate to measure the recovery.

S. No.	Variables	Tests	Criterion measures
1.	Heart Rate	Telemetry watches	Beats/minute
2.	Respiratory Rate	Palpation Test	Numbers/minute

The researcher did the manipulation in the independent variable by specific anaerobic training at different times of the day.

Morning (0600 to 0700 hrs)
Afternoon (1200 to 1300 hrs)
Evening (1700 to 1800 hrs).

Combinations of few exercises are called one set of the floor events. Data was procured immediately, after 1:30, 3:00, 4:30 minute after the completion of the one set.

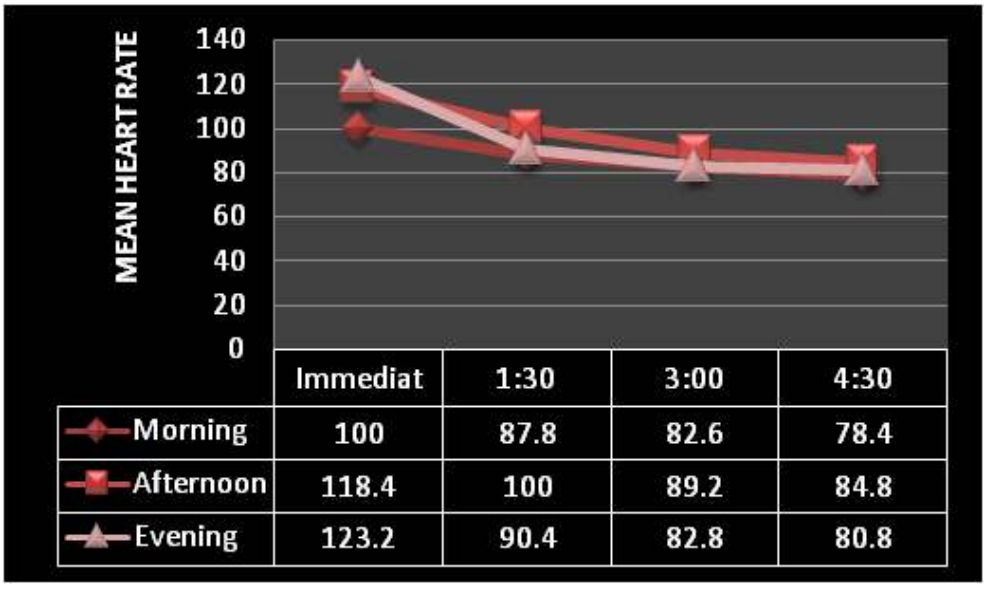
Selection of Specific Anaerobic Workout on Floor

- Handspring to forward somer salt.
- Forward somer salt to forward somer salt.
- Round off to forward somer salt.
- Round off to back somer salt.
- Round off to stretch body somer salt.
- Round off to side roll
- Forward somer salt.
- Handspring
- One leg handspring to both leg handsping.
- Four cartwheel.
- Dive roll.
- Round off back somer salt.
- Handspring to Forward somer salt.
- Round off to Streatch somer salt.

RESULTS

Findings pertaining to the descriptive statistics in morning, afternoon, and evening recovery are presented as under.

Figure 1
GRAPHICAL REPRESENTATION OF MEAN SCORES OF RECOVERY (HEART RATE) IN MORNING, AFTERNOON AND EVENING



	Immediat	1:30	3:00	4:30
Morning	100	87.8	82.6	78.4
Afternoon	118.4	100	89.2	84.8
Evening	123.2	90.4	82.8	80.8

Figure 1 shows that recovery rate is higher in the afternoon and evening in terms of heart rate but heart rate is very low in morning as compare to evening and afternoon.

Figure 2
GRAPHICAL REPRESENTATION OF MEAN SCORES OF RECOVERY (RESPIRATORY RATE) IN MORNING, AFTERNOON AND EVENING

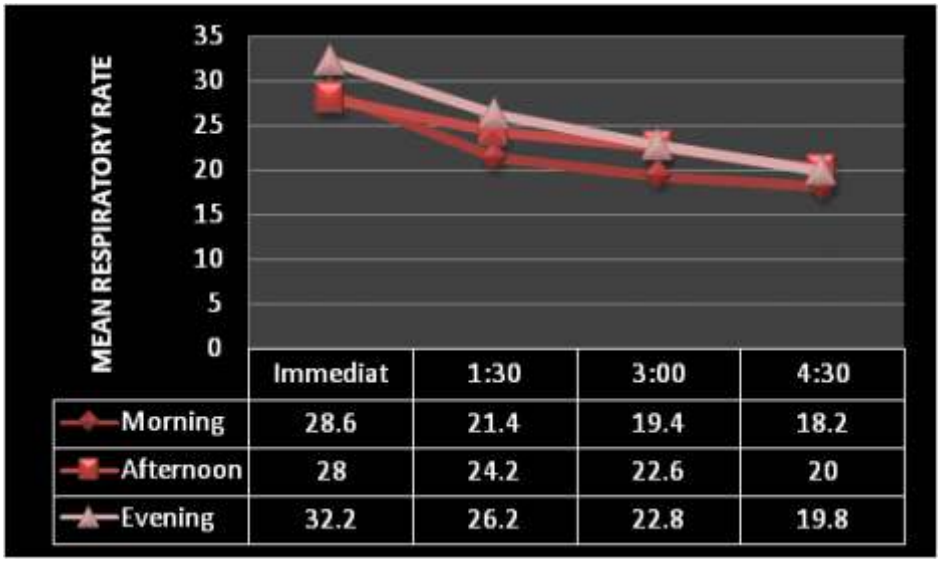


Figure 2 shows that recovery rate is higher in the morning and evening in terms of respiratory rate and there is steep decrease during the afternoon follows the same pattern.

Table 1
Descriptives of recovered HR and RR from the reserved

		Mean	Std. Deviation
Hr_recovery	Morning	78.40	6.38
	Afternoon	84.80	2.28
	Evening	80.80	3.03
Rr_recovery	Morning	18.20	2.77
	Afternoon	20.00	2.44
	Evening	19.80	2.48

Table 1 above shows that mean respiratory rate during morning, afternoon and evening are 18.20, 20.00 and 19.80 respectively, which implies that rate of recovery is same in morning, afternoon and evening. However, SD of respiratory rate is 2.77, 2.44 and 2.48 respectively and the mean heart rate during morning, afternoon and evening are 78.4, 84.8 and 80.8 respectively, which implies that rate of recovery is same in morning, afternoon and evening. However, SD of heart Rate is 6.38, 2.28 and 3.03 respectively.

Table 3
ANCOVA for the data on recovered HR and RR from the reserved

		Sum of Squares	df	Mean Square	F	Sig.
Rr_recovery	Pre RR	32.890	1	32.890	7.746	.018
	Groups	15.330	2	7.665	1.805	.210
	Error	46.710	11	4.246		
	Total	89.333	14			
	Pre HR	14.538	1	14.538	.775	.397
	Groups	61.093	2	30.547	1.629	.240
	Error	206.262	11	18.751		
	Total	325.333	14			

*Significant at 0.05 level of significance
**Tab. F = 4.18

Table 3 above indicates that calculated F-Value is insignificant at 0.05 level of significance (p>0.05). Thus, no significant difference exists in recovery pattern for initial 4 minutes 30 second in different times of day.

DISCUSSION OF FINDINGS

Lactic acid can contribute to muscle fatigue and lactic acid to be converted by the body during a recovery period before another anaerobic exercise can be performed. During the recovery period, the muscles will use oxygen to assist in replenishing the energy that was used during the anaerobic exercise. The experiment was conducted in the month of February that is late winter and early spring, during this time diurnal variation is not so prominent, may be this is a contributing factor for insignificant results of the study.

The subjects were elite gymnasts and had their training age at least more than 5 years in various stages and camps for varied duration and time of the day. They were well adapted to such short duration anaerobic training which showed insignificant difference of recovery in the diurnal variations. The training schedule prepared and executed may would have proved to be equal to produce much stress. Further we can't deny the fact that changes in heart rate and respiratory rate produced due to workouts lasting around 2 minutes are mostly influenced by the external factors.

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