

## Effect of SAQ Training on Physiological Variables among Rural Students of West Bengal and Western Uttar Pradesh

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### ABSTRACT

Any form of physical exercises continued to a period through the specific framework, it may improve the performance quality. SAQ is a form of physical exercises that is the acronym of the three special physical components speed, agility and quickness. The aim of the study was to find out the effect of 16 weeks SAQ training on resting heart rate (RHR), peak expiratory flow rate (PEFR) and body mass index (BMI) among the rural school students of West Bengal and Western Uttar Pradesh. The 40 rural school boys students of West Bengal state and 40 rural school boys Western Uttar Pradesh state were randomly included as subjects of the study and all were the class 6<sup>th</sup> to 8<sup>th</sup> standard. Subjects were equally divided two groups i.e. SAQ group and Control group in each place. A SAQ training was applied to subjects of SAQ groups in both places and variables RHR, PEFR and BMI were measure before and after the experiment. The t-test was used to analyzed the data and level of significant was sat at  $p < 0.05$ . After SAQ training RHR and BMI were significantly reduced and PEFR was significantly improved among the rural students of both places. The study concluded that the same physical exercise training has significantly improved selected physiological variables among the rural school students of West Bengal and Western Uttar Pradesh.

**KEYWORDS:** SAQ Training, Resting Heart Rate, Vital Capacity, Peak Expiratory Flow Rate, Rural Students, Geographical Different.

## 1. INTRODUCTION

The term training denotes a pre determined process of preparation for some specific tasks, that invariable extends to a period. When any form of physical exercises continued to a period through the specific framework, it may improve the performance quality. SAQ is a form of physical exercises, it is not new. It is the acronym of the three special physical fitness components i.e. speed, agility and quickness. The SAQ training is a strenuous training, specially used for skilled persons <sup>[1&2]</sup>. When SAQ training was applied on untrained adults, it significantly improved their neuromuscular function and physical performance ability <sup>[3]</sup> The saq training showed comparatively better effect in vo2 max then the yoga practices among the school students <sup>[4]</sup>. Previous study also reported SAQ training improved the speed and agility of school students of hearing impairment <sup>[11]</sup>. The study also showed saq exercises effected on inter college sports participants, where no specific skilled background of the participants <sup>[12]</sup>. When geographical condition becomes different, it associates the changes of human health and fitness capacity specially the physical characteristic and lungs function <sup>[5&6]</sup>. These geographical conditions may vary through the changes in area relative relief. In present study two different geographical areas rural school students were included i.e. Kharagpur block in Paschim Medinipur district of West Bengal state and Khekra block in Baghpat district of Western Uttar Pradesh state. The Paschim Medinipur district is located in south side of West Bengal state and Baghpat district is in Western side of Uttar Pradesh state. Whereas West Bengal is the state of eastern region and Uttar Pradesh is the state of northern region in India. There have lot of disparities between these states in both anthropogeography and physical geography.

### 1.1 Objective of the study

The objective of the present study was to examine the effect of SAQ training on resting heart rate, peak expiratory flow rate and body mass index among the rural school students of West Bengal and Western Uttar Pradesh.

## 2. MATERIALS AND METHOD

The pre and post test control group design was applied in present study. The rural school boys of West Bengal and Western Uttar Pradesh were included as subjects. The number of subjects in both places was forty (40) and two groups of equal subjects were formed in both places i.e. SAQ Group (SAQG) and Control Group (CG). Tentulmuri Mahammad Musthafa Madhyamik Shiksha Kendra in Karagpur, Paschim Medinipur district was the selected rural area in the state of West Bengal and St. Mary's Inter College in Rataul, Khekra block, Baghpat district was the selected rural area in the state of Western Uttar Pradesh. The subject's age ranged between 12 to 16 years (class 6<sup>th</sup> to 8<sup>th</sup> standard). The both schools being located at remote rural areas in these states in India and selected subjects were the residents of selected schools surroundings.

A 16 weeks SAQ training programme was applied to the subjects of SAQG in both places and the selected physiological variables resting heart rate, peak expiratory flow rate and body mass index were tested before and after the training.

### 2.1 SAQ Training Protocol

The equipment and non equipment based SAQ exercises were selected through the reviewed of

past studies [10-12&14]. The training continued to 16 weeks with three sessions per weeks. The every session was 60 minutes in duration and organized under expert supervisor. The training programme was consisted with Leader Drill (Straight Run Quick Steps), Leader Drill (Two Foot Run), Lateral Run Drill, L Drill, T Drill, M drill, Slalom Weave Drill, Run Shuffle Shuffle Run Drill, Box or Four Cones Drill and 5-10-5 Pro Agility Drill, included first and last 10 minutes warm up and cool down exercises. During training load capability of subjects were prime consideration rather than intensity.

## 2.2 Measurement of Variables

The selected variables Resting Heart Rate (RHR), Peak Expiatory Flow Rate (PEFR) and Body Mass Index (BMI) were measured before and after training.

RHR: The heart beat/minute (bpm) was counted over the carotid artery [13] after 30 minute full rest. The one minute duration was determined by stopwatch.

PEFR: PEFR was measured by Wright Mini Peak Flow Meter [7]. In standing position the participant properly placed the mouth piece between his lips followed by deep breath as possible. Then breath out forcefully within the mouth piece after maximum inhalation. During breath out nose clip was used to confirm that the air not escape through the nose. Within three appropriate trails highest score was recorded in litter/minute (l/min).

BMI: The formula  $\text{Weight (Kg)} / \text{Height (mt)}^2$  was using to measure the Body Mass Index.

The weight in kg was measured by a standard weight machine and height in mt was measured by stadiometer. The warm up or exercises dresses allowed for weight measurement and shoes would not allowed for both in height and weight measurement.

## 2.3 Statistical Procedure

The pair t-test was applied to find out the significant of the study, independent t-test to compare the variables between the students of West Bengal and Western Uttar Pradesh and significant level was set at  $p < 0.05$  in all cases. The asymmetry and kurtosis values between -2 and +2 were followed to check the normality of the data. The data was calculated by Microsoft Excel 2007.

## 3. RESULT

**Table 1: Before and After Training Result of RHR, PEFR and BMI of SAQG and CG among School Students of West Bengal**

Variables	Group (n=20)	Before Training	After Training	T-value	P-value
RHR (bpm)	SAQG	76.5 ± 3.85	71.25 ± 1.51	6.19	0.00
	CG	75.55 ± 5.46	74.65 ± 2.34	0.81	0.21
PEFR (l/min)	SAQG	267.5 ± 53.69	298 ± 53.27	10.68	0.00
	CG	260.5 ± 55.58	261.5 ± 54.27	0.04	0.34

BMI (kg/mt <sup>2</sup> )	SAQG	19.55 ± 1.87	18.85 ± 1.86	5.64	0.00
	CG	20.03 ± 2.47	19.94 ± 2.49	1.33	0.09

Abbreviation- RHR=Resting Heart Rate, PEFR= Peak Expiatory Flow Rate, BMI= Body Mass Index, SAQG= SAQ Group, CG= Control Group

The table 1 has shown before and after training result of RHR, PEFR and BMI of of West Bengal rural school students. SAQG RHR reduced from 76.5 to 71.25 bpm, PEFR increased from 267.5 to 298 l/min and BMI reduced from 19.55 to 18.85 kg/mt<sup>2</sup>, their t-values were 6.19, 10.68, 6.64 respectively. The CG RHR was 75.55 and 74.65 bpm, PEFR 260.5 and 261.5 l/min, BMI 20.03 and 19.94 kg/mt<sup>2</sup>, their t-values were 0.81, 0.04, 1.33 respectively. Hence the SAQG RHR, BMI were significantly reduced and PEFR was significantly improved (p<0.05) and CG showed insignificant (p<0.05) in all variables.

**Table 2: Before and After Training Result of RHR, PEFR & BMI of SAQG & CG Western among School Students of Uttar Pradesh**

Variables	Group (n=20)	Before Training	After Training	T-value	P-value
RHR (bpm)	SAQG	74.85 ± 1.18	72 ± 1.71	5.89	0.00
	CG	73.2 ± 2.93	72.90 ± 2.02	0.41	0.34
PEFR (l/min)	SAQG	246 ± 36.18	273 ± 38.64	9.92	0.00
	CG	242 ± 51.56	243.5 ± 49.65	1.18	0.12
BMI (kg/mt <sup>2</sup> )	SAQG	20.18 ± 1.31	19.53 ± 1.15	7.81	0.00
	CG	20.01 ± 1.88	20.00 ± 1.87	0.77	0.22

Abbreviation- RHR=Resting Heart Rate, PEFR= Peak Expiatory Flow Rate, BMI= Body Mass Index, SAQG= SAQ Group, CG= Control Group

The table 2 has shown before and after training result of RHR, PEFR and BMI of Western Uttar Pradesh rural school students. The SAQG RHR reduced from 74.85 to 72 bpm, PEFR improved from 246 to 273 l/min and BMI reduced from 20.18 to 19.53 kg/mt<sup>2</sup>, their t-values were 5.89, 9.92, 7.81 respectively. The CG RHR was 73.2 and 72.90 bpm, PEFR 242 243.5 l/min, BMI was 21.01 and 20.00 kg/mt<sup>2</sup>. Hence the RHR, BMI of Western Uttar Pradesh rural school students were significantly reduced and PEFR was significantly improved (p<0.05) and CG showed insignificant (p<0.05) in all the variables.

**Table 3: Comparison of Height, Weight, RHR, PEFR & BMI between Rural Students of West Bengal & Western Uttar Pradesh**

Variables	West Bengal Rural School Students (n=40)	Western Uttar Pradesh Rural School Students (n=40)	T-value	P-value
Height (mt)	1.45 ± 0.05	1.47 ± 0.05	5.27	0.00
Weight (kg)	42.22 ± 7.13	43.82 ± 6.03	1.11	0.26
RHR (bpm)	76.02 ± 4.69	74.07 ± 2.95	2.16	0.03
PEFR (l/min)	264 ± 54.05	240.25 ± 42.33	2.18	0.03
BMI (kg/mt <sup>2</sup> )	19.79 ± 2.14	20.09 ± 1.60	0.84	0.40

Abbreviation- RHR=Resting Heart Rate, PEFR= Peak Expiatory Flow Rate, BMI= Body Mass Index, SAQG= SAQ Group, CG= Control Group

Table 3 has shown comparison of RHR, PEFR and BMI between West Bengal Rural School Students and Western Uttar Pradesh Rural School Students. The result showed RHR was significantly ( $p < 0.05$ ) lower in west Bengal rural school students. The PEFR was significantly higher in West Bengal school students and BMI was insignificant ( $p < 0.05$ ) between West Bengal Rural School Students and Western Uttar Pradesh Rural School Students. The physical characters likes height was significantly higher in Western Uttar Pradesh school students and weight was insignificant ( $p < 0.05$ ).

#### 4. DISCUSSION

The findings of the study was the 16 weeks SAQ training significantly reduced the RHR, BMI and significantly improved the PEFR among the rural students of West Bengal and also Western Uttar Pradesh. The result of the present study has supported by some previous studies, where SAQ training improved the resting pulse rate and vo2 max of school student<sup>[3]</sup>. Hand eye coordination and most of selected dynamic balances of 7 to 11 years old children's were improved due to six weeks SAQ training<sup>[8]</sup>. The application of SAQ training on college male students, showed improved the resting pulse rate and breath holding time<sup>[9]</sup>. SAQ training among rural schools showed significantly improved the vital capacity and peak expiatory<sup>[10]</sup>.

The comparative result of selected variables between school students of West Bengal and Western Uttar Pradesh showed, RHR was lower in west Bengal rural school students, PEFR was higher in West Bengal school students and BMI was insignificant but the Western Uttar Pradesh school students were taller than the West Bengal school students. This exist difference between the subjects of two places may have due to environmental pollution, the selected place of Western Uttar Pradesh has near about 50 km away from the capital city of India and other selected place of West Bengal has far away from the metropolitan. In present study same exercise training i.e. the combination of speed agility and quickness methods was conducted

among the school students of two different places. Whereas the engaged school students of both places were rural and same age groups such as class 6<sup>th</sup> to 8<sup>th</sup> standard. After experiment study shown selected physiological variables RHR, PEFR and BMI were significantly changed among the class 6<sup>th</sup> to 8<sup>th</sup> standard school students of both selected places.

## 5. CONCLUSION

The findings of the study concluded that the same physical exercise training significantly reduced resting heart rate, body mass index and significantly improved peak expiratory flow rate among the rural school students of different geographical areas. The study also recommended for same study on large group of subjects and also assumed that same physical exercise training programme and its effect between different latitudinal areas like plane and hills may have significant difference.

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