



Department of Sports Science & Yoga
Ramakrishna Mission Vivekananda Educational and
Research Institute (RKMVERI), Belur

Report of the
APPICON 2022 pre-conference workshop on
Assessing exercise-induced stress on cardio-respiratory &
neuro-cognitive responses

12 December 2022

Sponsored by -



APPICON 2022



68th Annual National Conference of Association of Physiologists
and Pharmacologists of India

TRANSLATIONAL MEDICINE: FROM MOLECULES TO INDIVIDUAL

Preconference Workshop 18

Assessing exercise-induced stress on cardio-respiratory & neuro-cognitive
responses

JOINTLY ORGANIZED BY
DEPARTMENT OF PHYSIOLOGY & PHARMACOLOGY, GMCH, CHANDIGARH
DEPARTMENT OF PHARMACOLOGY, PGIMER, CHANDIGARH



Workshop Venue:

Department of Sports Science and Yoga,
Ramakrishna Mission Vivekananda Educational & Research Institute, Belur Math

12 DECEMBER 2022



Overview

Motivation, effective training, 360-degree scientific support, nutrition, tactical planning, and other aspects play a role in sporting success. India's performance in the recently concluded Birmingham Commonwealth Games 2022 where India won 61 medals, Tokyo 2020 Summer Olympics where India won 7 medals including one precious gold medal in the Javelin throw, and an incredible 19 medals achievement in Paralympics, signifies India's progress towards a leading country in sports. This is inevitable that this journey could not be possible without sports science support, proper training, and recovery management. To compete and level with the internationally leading countries in the sports arena, it is necessary for Indian support staff, aspiring professionals, and students to develop skills by using the latest technologies and advanced tools to analyze athletes and provide necessary suggestions to improve performance. To cater to this modern era of a scientific approach to sports, the Department of Sports Science and Yoga of Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), Belur Math, West Bengal which is equipped with modern laboratories and classrooms, state-of-the-art conference room, a fully functional fitness centre and huge Yoga halls had organized a pre-conference workshop (PCW) on 'Assessing exercise-induced stress on cardio-respiratory & neuro-cognitive responses' under the aegis of APPICON 2022 on 12th December 2022.

Workshop program details

The workshop started with a brief introduction and orientation to various sports science labs, instruments, and modern methodologies that sports fraternity is using by Dr. Arnab Das, Coordinator of PCW18 and Assistant Professor, Department of Sports Science & Yoga, RKMVERI. After that a cardio-respiratory stress test was conducted on a treadmill using metabolic gas analyzer Cosmed Quark CPET (Germany) and the participants monitored the real-time breath-by-breath cardio-respiratory responses till exhaustion. Changes in the key parameters like the volume of oxygen consumption (VO_2), volume of carbon dioxide production (VCO_2), minute ventilation (VE), respiratory frequency (Rf), substrate utilization parameters and etc. during a graded exercise task were monitored, analyzed and explained. The candidates also monitored the post-exercise recovery responses and learnt how to interpret those data. This part was organized in the ***Exercise physiology & Clinical evaluation laboratory*** at the Department of Sports Science and Yoga, RKMVERI.

The next part of the workshop was on the acquisition of electroencephalographic (EEG) recording in a subject performing a cognitive task and on biofeedback training. Biofeedback training is a new way to monitor and control the subtle changes happening in our

body, and often to improve physical performance and health conditions. This training is very popular nowadays in sports which inculcates the athlete's arousal regulation skill, maintaining focus and staying relaxed throughout the competition. In this part, the candidates saw the changes happening in the brain waves during a task, how to acquire EEG waves, and also monitored a biofeedback training session. This part was organized in the **Neurophysiology and cognition laboratory** at the Department of Sports Science and Yoga, RKMVERI. Our HOD Br. Mrinmay Maharaj gave valuable remarks at the end and the workshop came to an end after the lunch.

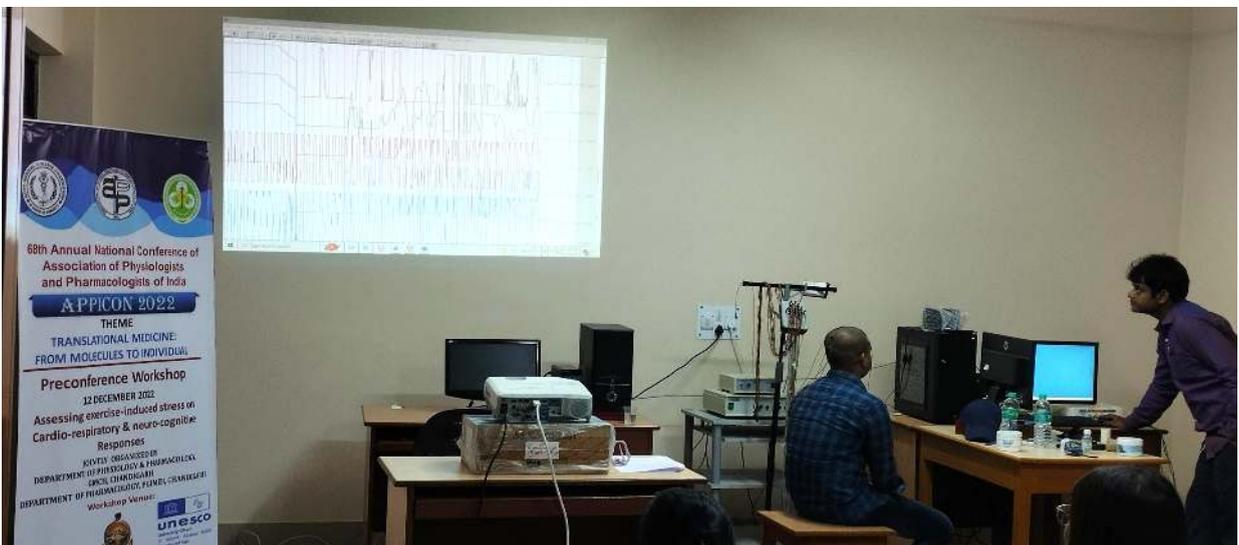
Please see the schedule below for more information –

Sl. no	Time	Event	Resource person
1	9:00 am – 9:30 am	Registration	
2	9:30 am – 10:00 am	Introduction and orientation to various labs of sports sciences, tools and modern techniques	Dr. Arnab Das
3	10:00 am – 11:30 am	Assessment of cardio-respiratory fitness using Metabolic Gas Analyzer Cosmed Quark CPET and Polar Heart Rate Sensor Assessment of post-exercise recovery response	Dr. Arnab Das, Dr. Kunal Sikder
4	11:30 am – 12:15 pm	Acquisition of electroencephalographic (EEG) recording in a subject performing a cognitive task and understanding the EEG wave pattern	Dr. Arkadeb Dutta, Dr. Subhadip Paul
5	12:15 pm – 1:00 pm	Biofeedback training	Dr. Manohar Kr. Pahan
6	1:00 pm - 1:15 pm	Concluding remarks	Br. Mrinmay Maharaj
7	1:30 pm – 2:30 pm	Lunch Break & Interaction	

Cardio-pulmonary fitness testing



Acquisition of Electroencephalographic (EEG) recording



Biofeedback training



Concluding remarks



Workshop banner

Three workshop standees were placed at relevant places in our university campus.



Workshop kit

The workshop kit given to participants consisted of one pad, one pen, and one printed badge.

Workshop food

Veg and non-veg lunch based on participant's preference were arranged at 'Rangoli Mall' Food Court, which is just 800m far from the department.



Workshop attendance

The entire workshop was conducted in offline mode. Registered participants along with our department faculties, Ph.D. scholars, and post-graduate students took part in the workshop in offline mode. Please find the attendance below –

68th APPICON 2022, Chandigarh
PCW18: Assessing exercise-induced stress on cardio-respiratory & neuro-cognitive responses
 Venue: Ramakrishna Mission Vivekananda Educational & Research Institute, Belur
 Timings: 09:00AM to 12:30PM

Dr. Kalipada

List of Participants

SL No.	Name	Registration no.	Signature
1	Dr. Arnab Das	C2_PE_14245	<i>Dr. Arnab Das</i>
2	Avany Sathyan	C3_PE_12207	-
3	Tiyasha Bhowmick	W2_PL_15473	<i>Tiyasha Bhowmick</i>
4	Ratna Sarkar	W2_PL_15478	<i>Ratna Sarkar</i>
5	Minu Sen	W2_PL_15431	<i>Minu Sen</i>
6	Suparna Santui	W2_PL_15432	<i>Suparna Santui</i>
7	Avantika Ray	W2_PL_15476	<i>Avantika Ray</i>
8	CHITRALEKHA LAHIRY	W2_PL_15458	<i>Chitralekha Lahiry</i>
9	Saswati Naskar	W2_PL_15464	<i>Saswati Naskar</i>
10	Meghna Basu	W2_PL_16454	<i>Meghna Basu</i>
11	Soumik Bera	W2_PL_15482	<i>Soumik Bera</i>
12	Soumili Datta	W2_PL_16451	<i>Soumili Datta</i>
13	Ananya Chowdhury	W2_PL_16452	<i>Ananya Chowdhury</i>
14	AVAN DAS	W2_PL_15485	<i>Avan Das</i>
15	Sanchaita Das	W2_PL_15480	<i>Sanchaita Das</i>
16	Kinza Sarkar	W2_PL_15424	<i>Kinza Sarkar</i>
17	Sajmerul sk	W2_PL_15422	<i>Sajmerul sk</i>
18	Manisha Das	W2_PL_16457	<i>Manisha Das</i>
19	Prithwish Kar	W2_PL_15419	<i>Prithwish Kar</i>
20	RICHA GANGULY	W2_PL_15448	<i>Richa Ganguly</i>
21	ANKITA BAKULI	W2_PL_15425	<i>Ankita Bakuli</i>
22	Pubali Roy	W2_PL_16465	<i>Pubali Roy</i>
23	SUSRITA PAL	W2_PL_15983	<i>Susrita Pal</i>
24	Madhuparna Bhattacharya	W1_PL_15455	<i>Madhuparna Bhattacharya</i>
25	Nibanta Chakraborty		<i>Nibanta Chakraborty</i>

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List of Participants

SL No.	Resource Person	Designation	Signature
	Arikadeb Dutta	Assistant Professor	<i>Arikadeb Dutta</i>
	Kunal Sikdar	Assistant Professor	<i>Kunal Sikdar</i>
	Rupayan Bhattacharya	Professor	<i>Rupayan Bhattacharya</i>
	Subhadip Paul	Assistant Professor	<i>Subhadip Paul</i>
	Manohar Kr. Pahan	Assistant Professor	<i>Manohar Kr. Pahan</i>
	Dr. Kalipada Pal	Professor	<i>Dr. Kalipada Pal</i>
	Dipankar pal	Professor	<i>Dipankar pal</i>
	Subhashis Biswas	Ph.D Scholar	<i>Subhashis Biswas</i>
	Sarjoy Majhi	Ph.D Scholar	<i>Sarjoy Majhi</i>
	Debabrata Chatterjee	Ph.D Scholar	<i>Debabrata Chatterjee</i>
	Rangan Pan	MSc. Sports Sci.	<i>Rangan Pan</i>
	Malay Kumar Hait	MSc. Sports Sci.	<i>Malay Kumar Hait</i>
	Niladri Chowdhury	MSc. Sports Sci.	<i>Niladri Chowdhury</i>
	Chayan Kundu	MSc. Sports Sci.	<i>Chayan Kundu</i>
	Injamul Haque	MSc. Sports Sci.	<i>Injamul Haque</i>
	Mokaddam Hossain	MSc. Sports Sci.	<i>Mokaddam Hossain</i>
	Tiyash Biswas	MSc. Sports Sci.	<i>Tiyash Biswas</i>
	C Hari Vishnu	MSc. Sports Sci.	<i>C Hari Vishnu</i>
	Ge Chandru	MSc. Sports Sci.	<i>Ge Chandru</i>
	Sudash Kumar K	MSc. Sports Sci.	<i>Sudash Kumar K</i>

Dr. Kalipada

Advertisement of the workshop:

The advertisement was put on the departmental website for wider publicity and the reach of the APPICON 2022 PCW18 (<https://sy.rkmvu.ac.in/appicon-2022-workshop/>)



The following workshop template shared by the Organizing Chairperson Dr. Anita Singh has also been circulated widely at the local level.

APPICON 2022
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PCW 18: Assessing exercise-induced stress on cardio-respiratory & neuro-cognitive responses
Date: 12.12.2022 Venue: Ramakrishna Mission Vivekananda Educational & Research Institute, Belur Math, Howrah, West Bengal
Timings: 09:00AM to 12:30 PM

 Dr. Arnab Das Assistant Professor, Department of Sports Science & Yoga, RKMVERI, Belur	 Dr. Kunal Sikder Assistant Professor, Department of Sports Science & Yoga, RKMVERI, Belur	 Dr. Arkadeb Dutta Assistant Professor, Department of Sports Science & Yoga, RKMVERI, Belur	 Dr. Subhadip Paul Assistant Professor, Department of Sports Science & Yoga, RKMVERI, Belur	 Prof. Manohar Kumar Pahan Assistant Professor, Department of Sports Science & Yoga, RKMVERI, Belur
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Overview/enumeration of the techniques to be shown

- ❖ Assessment of cardio-respiratory fitness using Metabolic Gas Analyzer Cosmed Quark CPET and Polar Heart Rate Sensor
- ❖ Assessment of post-exercise recovery response
- ❖ Acquisition and interpretation of electroencephalographic (EEG) in a subject performing a cognitive task
- ❖ Biofeedback training
- ❖ Analysis & interpretation of the data

**Last date extended till
30.11.2022**

**Please use this link to initiate registration
<https://appi.org.in/APPICONRegistration>**

Thank you.
