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MAJLIS SUKAN NEGARA MALAYSIA

# COACHING JOURNAL

AKADEMI KEJURULATIHAN  
KEBANGSAAN



# 2013



KE ARAH KECEMERLANGAN SUKAN  
Towards Excellence in Sports



# OUTSTANDING COACHES

## Jan June 2013

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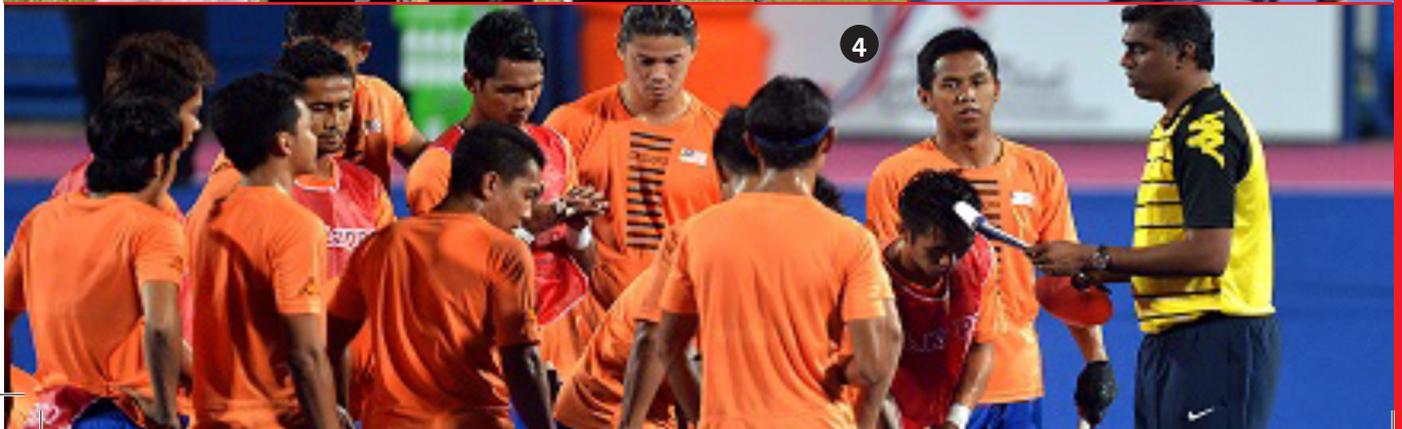
**Gambar 1** | THE 33rd ASIA CYCLING CHAMPIONSHIPS AND THE 20TH ASIA JUNIOR CYCLING CHAMPIONSHIPS, NEW DELHI, INDIA 7 – 17 MARCH 2013

**Coach** | Suod Hussain (far left) & Junaidi Mohd Nasir (far right) -Achievement: 4 gold, 1 silver, 4 bronze

**Gambar 2** | THE 1ST ASIAN GRAND PRIX ARCHERY, BANGKOK, THAILAND 9-15 MARCH 2013

**Coach** | Lee Jae Hyung -Achievement : 1 gold ( Men's Team Recurve)

**Gambar 3 dan 4** | RUNNERS UP -THE SULTAN AZLAN SHAH CUP 2013 -Coach : Arul Selvaraj & Paul Ravington



MAJLIS SUKAN NEGARA MALAYSIA

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## Message From Editorial Advisor

“Insanity is doing the same thing you’ve always done and expecting different results”. Efficiency of any organization is the sign that translates the extent it is active and progressing. As they say, time will determine the yet to come achievements, I am quite optimistic the drastic change from Buletin to Coaching Journal will make more interesting added with knowledge and based information on coaching. The production of the 1st edition of its two issues of Journal annually by the Akademi Kejurulatihan Kebangsaan, clearly defines well the willingness to progress even further.

The efforts transcended in addition to maintaining the Academy as being the best and to look after every needs of the coaching placed here is a clear indication on the commitment of this Academy. This exemplary gesture, in my opinion and also my hope that the progress could be seen.

I feel that by now the existence of this academy by the National Sports Council is known by each and every Sports Association and Sports fraternity. As such it is time that the academy diverts its concentration and put in all efforts together to go for coaches’ performance achievements at top class meets. Once this is attained, I think more coaches will knock at the door of this academy to upgrade performance in coaching aspects. This academy having attained so much of success within a short spurt of time, I am sure with the help of Ministry of Sport, the Malaysian government added with extra efforts and concentration, the reality is within reach.

Once again, I wish to thank the Director General of National Sports Council for allotting me this space to deliver my message and also congratulate this academy for producing the journal filled with a lot of information. With such quality and priceless information, I am sure this journal will one day be a much awaited issue annually. On the same note, I am grateful and my sincere appreciation to all Board Members and writers for the continuous support bestowed upon this academy.

**EN. AHMAD ZAWAWI ZAKARIA**  
Editorial Advisor  
COACHING JOURNAL  
AKADEMI KEJURULATIHAN KEBANGSAAN

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**COACHING JOURNAL** is published twice a year by the NATIONAL SPORTS COUNCIL OF MALAYSIA. Contributors are welcome to submit related articles at any time throughout the year. Article should be submitted via email to [lboonhooi62@gmail.com](mailto:lboonhooi62@gmail.com) | [hockey-vive@yahoo.com](mailto:hockey-vive@yahoo.com) and be submitted in English. Each article will be reviewed and edited if necessary and authors will be notified of acceptance within 6 to 8 weeks from the date of submission.

# Article Contribution for Coaching Journal Akademi Kejurulatihan Kebangsaan

## OBJECTIVE OF THE JOURNAL

### TO KEEP THE COACHES ABREAST OF THE LATEST DEVELOPMENTS IN COACHING RELATED AREAS OF INTERESTS

## TARGET AUDIENCE

Coaches - the Journal will be distributed to coaches (grassroots right up to elite level). The other possible readers would be the athletes.

We have endeavoured to make the Coaching Journal a much better read. To a certain extent we have succeeded in streamlining the content, but overall are still far from satisfied. As part of our efforts to further improve the Journal, we are continuously accepting article contributions from interested parties. We invite submissions from sports associations, academicians, sports administrators as well as coaches on topics ranging from academic to on field applied areas of interest. It can be an original research, technical commentary, knowledge base update or even association report; as long as it is related to coaching matters – it will be considered. Below are some guidelines to submitting an article:

## CONTENT

It should be straight forward and easy to understand. The methods and statistic section need not be too detailed. It is alright to use previous published work with the relevant permissions acquired. More importantly, instead of a general conclusion please add a section “Practical Application for Coaches”. In this section, explain how coaches can utilize the content of your article in their everyday work. We also recommend that you highlight important lines/paragraphs in your article. As with any printed work, please cite the relevant sources should the article include any external content/picture/table/figures.

## FORMAT

- Arial, 11 pts, single spacing
- Justified alignment, margins 2.54cm all around (letter)
- Title is Bold, include the affiliations under it.
- Reference Citation in text is (numbered) - Notes style, Vancouver
- Include a picture of the first author

The Journal is a registered periodical with a designated ISSN number. This makes it easier to catalogue and cite. Consequently, we also send copies of the Journal to all the relevant libraries.

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## DR. LIM BOON HOOI

Editor in Chief

The Official Journal of the Akademi Kejurulatihan Kebangsaan Majlis Sukan Negara Malaysia



## Gender Differences on Total Mood Disturbance Responses to Autogenic Relaxation Prior to Competition

### ABSTRACT

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The promotion of mood regulation strategies among athletes is not new but evidence about the efficacy of such strategies in sport is scarce. The objectives of the current study were to examine the effects of Autogenic Relaxation on regulating Total Mood Disturbance (TMD) and to investigate gender differences on TMD Responses to Autogenic Relaxation prior to competition. Participants were youth state volleyball players (N = 48; male = 24, female = 24; M age = 16.35 yr., SD = .89 yr.) The abbreviated version of the Profile of Mood States (POMS) was employed to examine the TMD Scores on pre and post-intervention. The intervention was carried out twice a week, 30 minutes/session for 8 weeks before training. A paired-samples t-test indicated that mean scores of the TMD were significantly lower during post-intervention,  $t(47) = 9.25, p < 0.05$ . Results of this study revealed that male players reported significantly lower,  $t(46) = -2.23, p < 0.05$  on post-intervention TMD Scores compared to female players. Standard Autogenic Training appears to be useful procedure to induce significant changes on TMD responses prior to competition in current study.

“GENDER DIFFERENCES, AUTOGENIC RELAXATION, TOTAL MOOD DISTURBANCE”



## INTRODUCTION

Although the promotion of mood regulation strategies among athletes is not new [1], evidence about the efficacy of such strategies in sport is scarce. In the general psychology literature, there is a relative consensus that people tend to monitor and evaluate their moods, and also that they develop and implement personal self-regulation strategies [2].

The effects of relaxation in mood regulation can be observed in a study of Japanese adults [3]. The researchers reported positive effects of 10-minute relaxation exercises on general mood ratings using Profile of Mood States (POMS). Furthermore, they observed a greater reduction in confusion and fatigue scores post-intervention in the relaxation group compared with the control group [3].

One method of mood-management is self-regulation. It is suggested that individuals tend to actively monitor their moods and develop self-regulating strategies to reduce negative mood and increase positive mood [4]. Autogenic Relaxation technique has been used by many practitioners [5], the Autogenic Relaxation technique relaxes the mind to relax the body. It uses both visual imagery and body awareness to move a person into a deep state of relaxation. The person imagines a peaceful place and then focuses on different physical sensations, moving from the feet to the head. The Autogenic Relaxation technique uses six “standard exercises” including self-suggestions of heaviness and warmth on the limbs, a regular and rhythmic heart beat, coolness of the forehead, warmth in the solar plexus, and autonomic breathing.

Previous study examined gender-related differences in the psychological response to weight reduction in 43 judoists. The Total Mood Disturbance (TMD) score in POMS significantly increased after weight reduction only in weight reduction group males. In the female weight reduction group, the anger and depression scores decreased after weight reduction, and the pre-value of the TMD score in this group was relatively high [6].

Therefore, although we believe that a gender difference in response to Autogenic Relaxation also exists in athletes, no studies have, however, examined this. To consider each gender appropriately after the Autogenic Relaxation sessions, it is important to study whether any gender-related difference exists in the response to Autogenic Relaxation on regulating TMD. This study attempt to gain an insight in this area that will be a benefit approaching to the sports fielders.

Given the potential contribution of Autogenic Relaxation on regulating TMD, and understanding the nature of mood may help athletes to reach optimal performance. Thus, the objectives of the current study were to examine the effects of Autogenic Relaxation on regulating TMD and to investigate gender differences on TMD Responses to Autogenic Relaxation prior to competition.

## PARTICIPANTS

Participants were youth state volleyball players (N = 48; male = 24, female = 24; M age = 16.35 yr., SD = .89 yr.) competing in the Under 18 National School Sport Council of Malaysia Volleyball Tournament. They were players selected to represent two states in Malaysia (i.e., Negeri Sembilan, Malacca) in that tournament. The participants were fully acquainted with the nature of the study prior to giving written informed consent to participate. Their selection was based on their availability and they are competing at the national level. Participants were assured confidentiality regarding the data collected and their personal identity. Ethical approval for the study was obtained from the University of Malaya ethics committee.



A COACH IS SOMEONE WHO CAN GIVE CORRECTION WITHOUT CAUSING RESENTMENT...

#### INSTRUMENT

The abbreviated version of the POMS [7] consists of 30 items. The participants rated the 30-items using the “Right Now” response set on a five-point scale ranging from 0 (Not at all) to four (Extremely) and generated six subscales of Tension, Depression, Anger, Fatigue, Vigor, and Confusion. The scores from the six subscales were aggregated by summing the five negative mood scales, subtracting vigor, and adding a constant of 20 to avoid negative scores; this yielded an overall TMD. Higher TMD Scores indicated more negative mood states. The POMS is one of the most commonly used measures of mood in exercise research [8] and has demonstrated acceptable reliability and validity with a variety of populations [7].

#### PROCEDURES

Permission to conduct the study was obtained from the relevant authorities. Specifically, permissions to involve players in the study were obtained from the Sport Unit, State Education Department, team managers and coaches from the participating teams. Furthermore, the study protocol was approved by the Research Ethics Committee (Human) of the author’s institution.

Pre-Intervention measures of mood states were obtained on-site during training session 8 weeks prior to official competition. The intervention used in this study was the Standard Autogenic Training. It usually takes 8 weeks to learn the technique, and home practice of the exercises is encouraged [9]. All the 8 weeks training sessions were carried out at the meeting room of training venue, and it were assisted by the Sport Psychologist from National Sport Institute of Malaysia.

The intervention was carried out twice a week, 30 minutes/session for 8 weeks before their sport skill/technical training. After completion of the 8 weeks Standard Autogenic Training, the participants were assessed again on the mood states one day prior to competition at the competition venue. Sessions were conducted in a meeting room with the air conditioner temperature was set at 25c. Participants were seated approximately one meter from each other.

#### STATISTICAL ANALYSIS

Paired-samples t-test was employed to compare the significant difference on the mean of TMD between pre and post-intervention for the whole group. An independent samples t-test was used to determine the gender differences on TMD responses to Autogenic Relaxation prior to competition. Raw data were converted to corresponding t scores. The significant value was set at  $P < 0.05$ . For all statistical analyses, SPSS 19 was used.

## RESULTS

Comparison of the TMD mean Scores between Pre and Post Interventions for the whole group was presented in Table 1. A paired-samples t-test indicated that mean scores of the TMD were significantly lower during post-intervention ( $M = 30.75$ ,  $SD = 2.97$ ) than pre-intervention ( $M = 36.31$ ,  $SD = 2.87$ ),  $t(47) = 9.25$ ,  $p < .001$ .

Table 1:  
Comparison of TMD Mean Scores between Pre and Post Interventions for the Whole Group

Session Mean (SD)	TMD	t	df	Sig. (2-tailed)
Pre-Intervention Post-Intervention	36.31 (2.87) 30.75 (2.97)	9.25	47	.001

Levene's test for homogeneity showed that the assumption of equality of variance between genders on the pre-intervention mean scores of TMD was not violated,  $t(46) = 0.96$ ,  $p > 0.05$ .

The mean and standard deviation of TMD Scores between gender on Pre and Post Interventions are presented in Table 2.

Table 2:  
Mean and Standard Deviation of TMD Scores between Gender on Pre and Post Interventions

Session Mean (SD)	TMD Scores Male Mean (SD)	Female	t-value	df	Sig.(2-tailed)
Pre-Intervention Post-Intervention	36.71 (3.18) 29.83 (2.50)	35.92 (2.54) 31.67 (3.17)	0.96 -2.23	46 46	0.35 0.03

An independent-samples t-test indicated that the TMD mean Scores of the male players were significantly lower than the female players during post-intervention,  $t(46) = -2.23$ ,  $p < 0.05$ .

## DISCUSSION

The first objective of the current study was to examine the effect of Autogenic Relaxation on regulating TMD Scores prior to competition. The findings of the study indicated that TMD mean scores decreased from pre-intervention ( $M=36.31 \pm 2.87$ ) to post-intervention ( $M=30.75 \pm 2.97$ ) for the whole group regardless of gender. It revealed that significant difference of TMD mean scores,  $t(47) = 9.25$ ,  $p < .001$  between pre-intervention and post-intervention. This result resemble those of previous studies by Masamoto [10] & Tachiya [11], and thus, it can be stated that the present study illustrates the reduction on post-intervention TMD scores prior to competition typically brought about by Autogenic Relaxation. Current results showing that Autogenic Relaxation is an effective self-regulation strategy lend support for previous research on self-regulation strategies used by the general population [4].



In the current results, the TMD Scores significantly lower in male players,  $t(46) = -2.23$ ,  $p < 0.05$  than the female players during post-intervention. The result replicates the earlier findings of Roberta [12] where despite the similarity in disease severity, females are reported to have greater TMD than males. Females have more TMD due to reason quoted by Dawn [13] that cognitive and personality styles may affect mood. Family and culture bound traditions regarding female roles emphasize responsibility toward family over self and self-direction, physical expression in work and play. This result replicates the earlier findings that lower TMD in males when compared to female competitors [14] in the world-ranked tennis players. However, the findings of this study contradict previous study which examined gender-related differences in the psychological response to weight reduction in 43 judoists, the TMD scores in POMS significantly increased after weight reduction only in weight reduction group males.

The male athletes in the present study displayed lower TMD Scores than female athletes one day prior to competition; gender did influence TMD responses to Autogenic Relaxation. This finding preclude practical usage but indicate that future researchers will need to consider gender when examining pre-competition TMD and implementing psychological intervention, females need more time to practice the Autogenic Relaxation to help them handle TMD responses more positively.

Practitioners and researchers have traditionally neglected examining individual differences for improving the coping skills of athletes. With respect to the present study, acknowledging the unique needs and coping tendencies of athletes as functions of their gender in regulating TMD prior to competition. Thus, using the POMS to ask youth volleyball players to report how they feel “right now” could reveal higher TMD scores. More research with youth athletes will further clarify these findings.

In conclusion, the psychological preparation of volleyball players must be taken into consideration during the coaching process. Professional help and programming of the psychological preparation of the athletes and observation of their emotional conditions before and during a game is necessary to regulate TMD and contribute to the high effectiveness of volleyball players in Malaysia. We recommend the inclusion of Autogenic Relaxation training programs in the training regimen for youth volleyball players in order to help them better deal with their experience of regulating TMD prior to competition.

#### **PRACTICAL APPLICATION FOR COACHES**

Current results showing that Autogenic Relaxation is an effective self-regulation strategy on reduction of TMD scores prior to competition. The psychological preparation of athletes must be taken into consideration during the coaching process. Coaches are encouraged to use the POMS on their athletes to report how they feel “right now”, it could reveal their athletes’ TMD score and implementing Autogenic Relaxation if necessary prior to competition.

#### **APLIKASI PRAKTIKAL UNTUK JURULATIH**

Hasil kajian ini menunjukkan Autogenic Relaxation adalah strategi regulasi-kendiri yang efektif untuk mengawal tahap TMD sebelum pertandingan. Persediaan psikologikal harus diambil berat dalam proses kejurulatihan. Jurulatih adalah digalakkan menggunakan POMS pada atlet mereka untuk melaporkan perasaan mereka pada masa itu, ia dapat memperolehi skor atlet pada masa itu dan mengaplikasikan Autogenic Relaxation jika perlu sebelum pertandingan.

## REFERENCES

1. Bond, J. (1990). Learning to check and adjust your mood states for higher quality competition performances. Belconnen, ACT: Australian Institute of Sport.
2. Wegner, D.M., & Pennebaker, J. W. (Eds.) (1993). Handbook of mental control. Englewood Cliffs, NJ: Prentice Hall.
3. Taniguchi T, Hirokawa K, Tsuchiya M, Kawakami N. (2007). The Immediate Effects of 10-minute Relaxation Training on Salivary Immunoglobulin A (s-IgA) and Mood State for Japanese Female Medical Co-workers. *Acta Med Okayama*.
4. Thayer RE, Newman R, McClain TM. (1994). Self-regulation of mood: strategies for changing a bad mood, raising energy, and reducing tension. *Journal of Personality and Social Psychology*, 67, 910-925.
5. Lehrer PM. (1996). Varieties of relaxation methods and their unique effects. *International Journal Stress Management*.
6. Yoshiko, Takashi, Shigeyuki, ArataKojima, Masaru, Noriko, & Kazuo (2006). Gender Differences in the Psychological Response to Weight Reduction in Judoists. *International Journal of Sport Nutrition and Exercise Metabolism*; 16, 187-198.
7. McNair, D. M., Lorr, M., & Droppleman, L. F. (1992). Revised Manual for the Profile of Mood States. San Diego, CA: Educational and Industrial Testing Service.
8. Berger, B. G., & Motl, R. W. (2000). Exercise and mood: A selective review and synthesis of research employing the Profile of Mood States. *Journal of Applied Sport Psychology*, 12, 69-92.
9. Kanji, N. (1997). Autogenic training. *Complementary Therapies in Medicine*, 5, 162-167.
10. Masamoto, K., Saito, M., Yoda, A., & Kuga, R. (2003). Psychological reactions and cardiac autonomic nervous function accompanying first-time autogenic training. *Japanese Journal of Hypnosis*, 47: 15-22.
11. Tachiya, Y., Mimura, S., Sugo, T., Kusumoto, Y., & Osada, K. (2005). Comparison of the physiological and psychological results of warmth sensation formulas and warmth sensation suggestions in autogenic training in competitive sports. *Japanese Journal of Hypnosis*, 49 (1): 9-17.
12. Roberta, K., Oka, Andrzej Szuba, John C., Giacomini and John P., Cooke. (2003). Gender differences in perception of PAD: a pilot study. *Journal of Vascular Medicine*, Vol. 8(2): 89-94.
13. Dawm, P., Lemcke, Julie Pattison, Lorna, A., Marshall and Dieborah, S., Cowley. (2003). *Current Care of Women*. Columbus: Hill Professional Publisher.
14. Meyers, M. C., Sterling, J. C., Treadwell, S., LeUnes, A., & Bourgeois, A. E. (1994). Mood and psychological skills of elite, world-ranked female tennis players. *Journal of Sport Behavior*, 17, 156-165.



# The Effects of Core Strength Exercises on Abdominal Strength

## INTRODUCTION

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The body core or trunk consists of abdominal and back muscles. Core strength is defined as the ability of the trunk to support the spine in a stable and balanced position [2]. Core stability is the combination of core strength and coordination of the core muscles during a movement [2]. Greater core stability may benefit sports performance by providing a stable foundation leading towards greater force production in the upper and lower extremities [8]. Improved core stability can also be translated into improved speed, balance and agility. Athletes with enhanced core stability are able to apply force more efficiently, generate higher kicking power, and maintained firmer stance while being tackled [5]. Core stability and strength program has been proved to be a valuable tool for rehabilitation and performance enhancement, provided the movement patterns are biomechanically efficient and improve functional movement. Hines [3] observed a 10% increase in stroke efficiency among high performance swimmers. While a lack of core strength and stability are posit to result in inefficient execution of technique, which might lead to injuries [7] for example groin strains and twisting injuries.

Recently traditional resistance exercises have been modified to emphasize core stability. Potential modifications include exercising on unstable rather than stable surfaces, exercising while standing rather than sitting, exercising with free weights rather than machines, and exercising unilaterally rather than bilaterally [9]. Despite the popularity of core stability training amongst rehabilitation, relatively few scientific studies had been conducted to demonstrate the benefits of core strength on healthy athletes [9]. The purpose of this study was to investigate the effect of 6-week core strength training program on abdominal strength among university athletes.

“COACHES WHO DON'T APPLY NEW REMEDIES SHOULD EXPECT TO SUFFER NEW TROUBLES”



## METHOD

### SUBJECTS

Thirty athletes from University of Malaya were recruited and randomly assigned to two groups; experimental group (n = 15) and control group (n = 15). Each group consists of 8 males and 7 females. The overall mean age of the subjects ( $M = 21.50 \pm 0.86$ ) years, mean height ( $M = 166.77 \pm 10.73$ ) cm and weight ( $M = 58.33 \pm 11.21$ ) kg. The mean age for experiment group ( $M = 21.08 \pm 7.55$ ), control group ( $M = 21.92 \pm 2.31$ ) while mean age for male ( $M = 20.72 \pm 1.28$ ) and female ( $M = 22.28 \pm 3.56$ ). All subjects were brief that their participation is voluntary, and they are allowed to withdraw from the study and anytime without penalty or consequences. Every subject is required to answer the Physical Activity Readiness Questionnaire (PAR-Q). The purpose of PAR-Q is to determine that subjects are healthy prior to their participation in any physical activity. Subjects were also requested to fill up an individual data form which was designed by researchers for the use of the research. Only the experiment group was exposed to core strength exercises (intervention), whereas the control group was instructed to continue with their normal dietary and physical activity routine throughout the study period.

### PROCEDURES

In this study, the one repetition maximum tests (1-RM) abdominal strength test was administered to measure the baseline data for abdominal strength of both groups. One repetition maximum tests (1-RM) is a common test, fitness professional and rehabilitation specialists use to quantify the level of strength, assess strength imbalances, and to evaluate training programs [1,4]. All subjects (experiment and control) participated in a 10 minutes warm-up and stretching session [6] followed by the abdominal strength tests using the abdominal flexion machine. The 1-RM abdominal strength test was conducted pre-and-post study to compare for abdominal strength. A cool-down session was incorporated to prevent blood pooling, regulate temperature and blood pressure to resting state [6]. The rationale of this session is to collect baseline 1-RM data for both groups.

Only the experiment group was exposed to the intervention (core strength program). The core strength program consists of 12 sessions spreading over 6 weeks. The core strength program started one week after pre-test (baseline). The experimental group was exposed to a twice a week training session. Prior to the training, researchers demonstrated and explained step-by-step basic procedures and safety reminders for core exercises.

During the first and second weeks of training session, 30 second was allocated for each exercise and each set consists of 10 core strength exercises. There were three sets in every training session. After every 30 seconds of exercise, subjects were allowed a 10 seconds rest before proceeding to the next exercise (Table 1). Each set consists of 10 exercises and to complete the entire session, three complete sets are required.

During third and fourth weeks, duration for each exercise was increased to 40 seconds with a 10 seconds rest after each exercise. Each set consists of 10 exercises and subjects need to finish three sets to complete the entire session.

During the fifth and final weeks of training, duration of each exercise was further increased to 50 seconds for each exercise with a 15 seconds rest in between exercise. Again, each set consists of 10 exercises and to complete the training session, three complete sets are required.

Table 1  
12 sessions of core strength exercises in 6 weeks intervention

Week	Session	Duration/ Exercise	Rest time	Set
1	1	30 second x 10 exercises	10 second	3
	2	30 second x 10 exercises	10 second	3
	3	30 second x 10 exercises	10 second	3
2	4	30 second x 10 exercises	10 second	3
	5	40 second x 10 exercises	10 second	3
3	6	40 second x 10 exercises	10 second	3
	7	40 second x 10 exercises	10 second	3
4	8	40 second x 10 exercises	10 second	3
	9	50 second x 10 exercises	15 second	3
5	10	50 second x 10 exercises	15 second	3
	11	50 second x 10 exercises	15 second	3
6	12	50 second x 10 exercises	15 second	3

## RESULTS

The abdominal strength of the experimental group during pre-test was ( $M = 110.67 \pm 26.31$ ) and post-test ( $M = 156.67 \pm 30.86$ ). On the other hand, the abdominal strength of control group during pre-test ( $M = 118.67 \pm 45.34$ ) and during post-test ( $M = 119.33 \pm 38.63$ ) in Table 2.

Table 2  
Descriptive Analysis of the Abdominal Strength Level between the Experimental Group and Control Group.

Group	Pre-test Mean & SD	Post-test Mean & SD
Control	$118.67 \pm 45.34$	$119.33 \pm 38.63$
Experimental	$110.67 \pm 26.31$	$156.67 \pm 30.86$

Table 3 showed paired samples t-test between the pre-and-post-tests of abdominal strength for the experimental group. There is a significant different between the pre-and- post test ( $t = -9.66$ ,  $df = 14$ ,  $p < 0.05$ ) for the experimental group

Table 3  
Paired t-test Within the Experimental Group on Abdominal Strength Level (abdominal strength test pre-test and post-test),  $p < 0.05$ .

Experimental Group	Paired Differences		
	t	df	Sig. (2-tailed)
Pre vs. Post	-9.66	14	0.001

Table 4 shows the paired samples t-test within the control group on abdominal strength level (abdominal strength test pre-test and post-test),  $p < 0.05$ . There were no significant differences between the pre-test and post-test ( $t = -0.20$ ,  $df = 14$ ,  $p > 0.05$ ) for the control group.

Table 4

Paired t-test Within the Control Group on Abdominal Strength Level (abdominal strength test pre-test and post-test),  $p < 0.05$ .

Control Group	Paired Differences		
	t	df	Sig. (2-tailed)
Pre vs. Post	-0.20	14	0.84

Table 5 shows the independent samples t-test between the experimental group and the control group on abdominal strength level (abdominal strength test post-test and post-test),  $p < 0.05$ . There are significant differences between the experimental group and the control group. ( $t = 2.92$ ,  $df = 28$ ,  $p < 0.05$ ) on the abdominal strength level during post-test.

Table 5

Independent Samples t-test (post test) between the Experimental Group and the Control Group on Abdominal Strength Level ( $p < 0.05$ )

Group	Paired Differences				
	Mean Diff.	S.E. Diff	t	df	Sig. (2-tailed)
Experimental Group vs. Control Group	37.33	12.77	2.92	28	0.007

## DISCUSSION

The purpose of this study was to investigate the effect of 6-week core strength training program on abdominal strength among University athletes. Results of the current study supported our understanding that core strength exercise improved abdominal strength of the experimental group even among healthy athletes.

Based on the results on Table 2, the core strength exercises greatly improved among the experimental group (110.67 to 156.67) but barely change among the control group (118.67 to 119.33). This study verified that core strength exercises may have contributed to the improvements of abdominal strength. Our result supported the findings by Fabre [2] that core stability exercise promotes better strength and muscle coordination performance during voluntary movements [10]. Stability of core base positively influence the effectiveness of energy transfer from muscle to limbs.

In our study, improvements in abdominal strength were evidence after only 6 weeks intervention. This lends support to exercise design proposed by Stanton [9] and Willardson [11] that 6-week of core training is sufficient to promote benefits although other studies might suggested other time frame. The results also showed a significant difference ( $p = 0.007$ ) between the pre-and-post test among the experimental group ( $t = 2.92$ ,  $df = 28$ ,  $p < 0.05$ ). Our results validated the study by Hines [3]. In contrast, no significant differences ( $p = 0.84$ ) were observed among the control group ( $t = -0.20$ ,  $df = 14$ ,  $p > 0.05$ ) as shown on Table 4.

Mean while, post test results also confirmed that there is a significance difference of the abdominal strength between the experimental group and the control group shown on Table 5. The result of independent t-test ( $t = 2.92$ ,  $df = 28$ ,  $p < 0.05$ ) lend support to the study done by Panjabi [5].

**PRACTICAL  
APPLICATION  
FOR COACHES**

Core strength exercises program is effective to strengthen the core (trunk) beside it also showed that 6-week of well structured exercise program is sufficient for athletes to reap benefits. From a practical standpoint, coaches may include core strength exercises in their training program enabling athletes to improve core strength which indirectly benefits sport performance.

**APLIKASI  
PRAKTIKAL  
UNTUK  
JURULATIH**

Program ekseksain kekuatan Core adalah efektif untuk meningkatkan kekuatan Core, hasil kajian ini juga menunjukkan program latihan Core berstruktur selama 6 minggu adalah memadai untuk atlet mendapat faedahnya. Dari sudut praktikal, jurulatih boleh memasukkan ekseksais kekuatan Core ini dalam program latihan supaya atlet dapat meningkatkan kekuatan Core yang akan memberi faedah kepada prestasi sukan.

**“THE GENUINE  
COACH  
GENERATE  
IDEAS AND  
OPENS THE  
MIND OF HIS  
PLAYERS. HIS  
FAR REACHING  
TASK IS TO LET  
THE OTHERS  
THINK,  
INSTEAD OF HE  
THINKING FOR  
THEM”**



## REFERENCES

1. Braith, R. W., Graves, J. E., Leggett, S. H., & Pollock, M. L. (1993). Effect of training on the relationship between maximal and submaximal strength. *Medicine & Science in Sports & Exercise*, 25, 132-138.
2. Fabre, K. Chamari, P. Mucci, J. Masse-Biron and C. Prefaut. (2002). Improvement of cognitive function by mental and/or individualized aerobic training in healthy elderly subjects, *International Journal of Sports Medicine* 23, 415-421.
3. Hines, C.A., Gambetta, V. (1999). Let's get physio.-for swim specific weight training, get on the ball. It's easy with our simple but effective physioball routine. *Rodale's Fitness Swimmer*. 8(3), 30-33.
4. Hoeger, W. W. K., Hopkins, D. R., Barette, S. L., & Hale, D. F. (1990). Relationship between repetitions and selected percentages of one repetition maximum: A comparison between untrained and trained males and females. *Journal of Applied Sport Science Research*, 4, 47-54.
5. Panjabi, M.M. (1992). The Stabilizing System of The Spine. Part 1. Function, Dysfunction, Adaptation, and Enhancement. *Journal of Spinal Disorders*5(4), 390-397.
6. Prentice, W. E. (2007). *Get Fit, Stay Fit* (4th ed.). New York: McGraw-Hill, 51-74.
7. Roetert, E.P. (2001). *High Performance Sports Conditioning Training*.
8. Vera-Garcia, F.J., Grenier, S.G., McGill, S.M. (2000). Abdominal Muscle Response During Curl-ups On Both Stable and Labile Surfaces. *Physical Therapy*80, 564-569.
9. Stanton, R., Reaburn, P. R., & Humphries, B. (2004). The effects of short term Swiss ball Training on core stability and running economy. *Journals of Strength & Conditioning Research*, 18(3), 552-528.
10. Hibbs, A. E., Thompson, K.G., French, D., Wrigley, A., & Spears, I. (2008). Optimizing Performance by Improving Core Stability and Core Strength. *Sports Medicine*, 38(12), 995-1008.
11. Willardson, J. M. (2007). Core stability training: applications to sports conditioning programs. *The Journal of Strength & Conditioning Research*, 21(3), 979-985.





# Acute Effects of Strength-Based and Running-Based Warming Up on Vertical Jump Performance

## INTRODUCTION

Athletes normally engage in an essential routine what generally known as “warm-up” prior to performing any physical activity [1]. Warming up precedes most athletic events because it is believed to prevent injury and assist in performance enhancement [2,9,10,11].

When at rest, blood circulation pooled at the center or core of our body limiting blood circulations to other parts of our body. Scientists and coaches believed that warm-up will potentially increase nerve conduction rate, increase muscle temperature, assisting in oxygen transportation through increase blood circulation, decrease viscous resistance and stiffness [3,12].

In general, active warm-ups divided into four different categories: “cardio-based” (e.g., running), “muscular-based” (e.g., strength exercises), passive or active “stretching”; and “specific” (resembling activity to be performed)[4]. In contrast, Burkett et al. [5] divided warm-up into specific and a non-specific techniques of warm-up. The non-specific technique involves movements not directly related to the actual activity to be performed and vice versa.

According to Villarreal et al. [6], different types of warm-up might influence jumping performance. For instance, weight loading on certain intensities during warm-up actually influences athletes jumping performance. A study Girard et al. [4] specified two kinds of different warm-up to measure isometric knee extension function and compared the acute effect of two types warming up on vertical jump performance. These two warm-up protocols are defined as strength-based warm-up (SWU) and running-based warm-up (RWU). Strength-based warm-up (SWU) includes a series of weight loading, whereas the running-based (RWU) include different pace running routines. It was reported that SWU and RWU induced similar results in terms of increase in knee extensors force-generating capacity by improving the muscle activation [4]. In order to test this hypothesis, usually vertical jump test is administered to measure for “explosive leg” power produced during jumps[5].

The understanding on effects produced by different warm-up routine is vital because the choice of appropriate warm-up routine is critical to ensure successful sports performances such as volleyball, basketball, or high jump. It is also important to determine whether leg power output is a key component in athletic performance [7].

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## OBJECTIVES

1. To measure the height of vertical jump after the Strength-Based Warm-up (SWU) and the Running-Based Warm-up (RWU).
2. To compare the vertical jump height between the Strength-Based (SWU) and the Running-Based Warm-up (RWU).

## METHODS

### PARTICIPANTS

Thirty healthy non-smoking male undergraduate students from University of Malaya, age ( $M=20.97$ ;  $SD=1.2$ ) volunteered for this study. Informed consent were obtained after participants were brief of the nature and possible risks. The participants were randomly assigned to two groups,  $n= 15$  students in Group 1 [Strength-Based Warm-up (SWU)] and  $n=15$  students in Group 2 [Running-Based Warm-up (RWU)]. Mean age of SWU is  $M= 21.42 \pm 1.302$  and RWU  $M= 20.47 \pm 0.834$ . There are no significantly different between both groups in terms of age, height, weight and BMI (Table 1).

Table 1  
Participants' Descriptive Statistics

Group		N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
	SWU	15	1.77	0.06	1.18	28	0.25
	RWU	15	1.74	0.06			
Weight	SWU	15	69.60	3.89	1.75	28	0.09
	RWU	15	66.80	4.81			
BMI	SWU	15	22.27	0.80	0.94	28	0.38
	RWU	15	21.99	0.84			

## PROCEDURE

A week before data collection day, participants were invited to the testing lab to accustom them with testing procedures. On data collection day, each subject was instructed to jog around the indoor multi-purpose hall for five minutes. Subsequently participants completed the pre-test vertical jump (baseline). The standard countermovement jump employed in this study required both feet to be stationed on the floor until take off. Just prior to the jump, a countermovement consisting of bending at the knees and the hips while at the same time flexing the trunk was performed. The height of each jump was measured by using the Vertec device. Participants were required to jump vertically (upwards) and knock the highest possible marker to provide a score. After the pre-test, the first group performed the strength-based warm-up (SWU) and the second group engaged in running-based warm-up (RWU). After both warming up protocol, all participants performed the post-test vertical jump measurement again. There were three trials for each pre and post test with the highest score of the three jumps taken into account for data analysis.

## WARM-UP PROTOCOLS

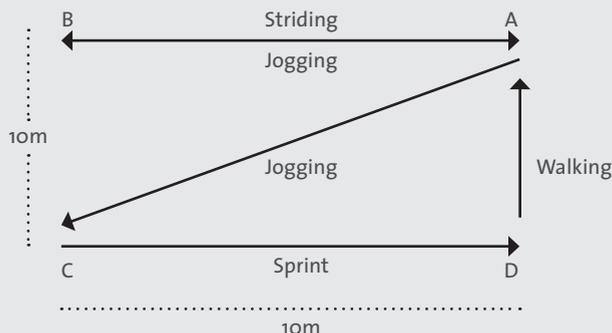
### RUNNING-BASED WARMING UP

The running-based warm-up consisted of indoor-multi station running. The indoor multi station running consists of four different stations that require different type of speed requirement which is walking, jogging, sprint and striding reminiscent of simple fartlek [13]. There were four stations marked with Cone A, B, C, D. Each cone is situated 10 meters from one another and forming a square of 10m x 10m on a flat indoor arena. The running-based warm-up (RWU) began with jogging from Station A to Station B. This was followed by striding from Station B back to Station A, then



jogged from Station A to Station C. Then sprint from Station C to Station D. Finally from Station D, participants walked back to Station A. There are 3 repetitions for each set. All subjects were required to perform 3 sets and 3 repetitions per set of exercise in this warming up protocol. There was 2 minutes restin between set.

Diagram 1  
Running Sequence



### STRENGTH-BASED WARMING UP

During the familiarization session, the all the subjects in the Strength-Based Warm-up group were tested for their 900 back squat one repetition maximum (1RM) according to the procedures outlined by McBride et al. [8]; this value ( $145 \pm 25$  kg) was used in applying the appropriate load in this group. The Strength-based warm-up consisted of strength exercises that involve two activities which is standing normal squat with weight barring 30% of 1 RM test of the subject and 60% of 1 RM test of the subject. Subjects first performed with weight barring 30% of 1 RM squat test by 2 sets for 10 repetitions per set. The second normal squat with weight barring 60% of 1 RM squat test of the subject accomplished for 5 repetitions per set, 2 sets per subject. Two minutes rest intervals were given between each set of strength exercises, while a 5 seconds rest interspersed repetitions. All light load repetitions (30% of 1 RM) were executed as quickly as possible.

### MEASUREMENT

Vertical jump height was measured to the nearest 1cm, and the highest absolute height difference was taking as the best score. The first measurement taken is the initial height of subjects' vertical jump. Following which, after the end of both warming up protocol, the final subject's vertical jump score was measured. This measurement value was recorded in centimeters.

## RESULTS

Table 2  
Comparison of the Vertical Jump Performance between Pre & Post Test for the Running-based Warm-up Group and the Strength-based Warm-up Group

Group	Pre-Test		Post-test		t	df	Sig. (2-tailed)
	Mean	SD	Mean	SD			
RunningBased Warm-Up	270.60	9.77	272.73	10.35	-4.00	14	0.001
StrengthBased Warm- Up	266.13	12.72	268.47	12.97	-5.27	14	0.001

Table 3  
Comparison of the Vertical Jump Performance between the Running-based and the Strength-based Warming Up (Pre-test)

Group	Mean Diff.	S.E. Diff	t	df	Sig. (2-tailed)
Running-Based Warm-Up vs. Strength-Based Warm-Up	4.47	3.44	1.29	14	0.22

Table 4  
Comparison of the Vertical Jump Performance between the Running-based and the Strength-based Warming Up (Post Test)

Group	Mean Diff.	S.E. Diff	t	df	Sig. (2-tailed)
Running-Based Warm-Up vs. Strength-Based Warm-Up	0.07	0.64	0.10	28	0.92

## DISCUSSION

The current study revealed significant differences between pre-test and post-test of the Running-Based Warming Up group or RWU ( $t = -4.00$ ,  $df = 14$ ,  $p < 0.05$ ) in Table 2. Positive result was also observed among Strength-Based Warming Up group showing significant differences in vertical jump score ( $t = -5.27$ ,  $df = 14$ ,  $p < 0.05$ ). The current results supported the studies of Safran et al. [1] and Burkett et al. [5] that states warming up do influence sport performance.

There is no significant difference between Strength-Based Warming Up group (SWU) and Strength-Based Warming Up (SWU) ( $t = 1.298$ ,  $df = 28$ ,  $p > 0.05$ ) during pre-testing or baseline shown in Table 3.

Similarly, this study found no significant differences between Strength-Based Warming Up group (SWU) and Strength-Based Warming Up (SWU) during post-testing vertical jump performance ( $t = 0.10$ ,  $df = 28$ ,  $p > 0.05$ ) Table 4. This supported the finding by Girard et al., [4] that both running based and strength based warm-up increased vertical jump performance. In line with the above study, further studies might aim at comparing four different warm-up protocols (running, strength, specific, active/passive stretching), gender factor, athletes versus non-athletes, and impact of SWU and RWU on various different sports.

## PRACTICAL APPLICATION FOR COACHES

Maximum performance in athletics is a vital key to success. Coaches are constantly striving for an edge over their competitors, and if warm-ups affect athletes' performance, then more studies should be conducted to find which warm-up will potentially boost performance. In the applied setting, the type of warm-up to be utilized greatly depend suitability and availability of resources (equipments/facilities) at the time of warming-up. For example, RWU does not require gym equipment as compare to SWU protocol hence RWU is viable when equipments are limited

## APLIKASI PRAKTIKAL UNTUK JURULATIH

Prestasi maksima dalam sukan adalah penting dalam kejayaan. Jurulatih sentiasa mencari kelebihan dalam mengatasi lawan, dan sekiranya rutin pemanasan badan akan mempengaruhi prestasi maka lebih banyak kajian perlu diberi keatas aktiviti pemanasan badan. Dari segi aplikasi, jenis memanaskan badan yang akan digunakan adalah bergantung kepada kesesuaian dan sumber yang sedia ada semasa sesi memanaskan badan. Misalnya pemanasan badan secara lariani tidak memerlukan alatan khas manakala latihan memanaskan badan dengan menggunakan bebanan, oleh itu pemanasan badan jenis larian adalah lebih sesuai sekiranya peralatan adalah terhad.

## REFERENCES

1. Safran, M. R., Seaber, A. V., & Garrett, W. E., Jr. (1989). Warm-up and muscular injury prevention. An update. *Sports Medicine* 8(4), 239-49.
2. Young, Wand & Elliot, S. (2001). Acute effects of static stretching, proprioceptive neuromuscular facilitation stretching, and maximum voluntary contractions on explosive force production and jumping performance. *Res Q Exerc Sport* 72: 273-282.
3. Bishop D (2003). Warm-Up II. Performance changes following active warm-up and how to structure the warm-up. *Sports Medicine* 33, 483-498.
4. Girard, O., Carbonnel, Y., Candau, R., & Millet, G. (2009). Running versus strength-based warm-up: acute effects on isometric knee extension function. *European Journal of Applied Physiology*, 106, 573-581.
5. Burkett, L. N., Phillips, W. T., & Ziuraitis, J. (2005). The best warm-up for the vertical jump in college-age athletic men. *Journal of Strength and Conditioning Research*, 19(3), 673-676.
6. Villarreal, E. S. S. D., Gonzalez-Badillo, J. J., & Izquierdo, M. (2007). Optimal warm-up stimuli of muscle activation to enhance short and long-term acute jumping performance. *European Journal of Applied Physiology*, 100, 393-401.
7. Holt, B. W., & Lambourne, K. (2008). The impact of different warm-up protocols on vertical jump performance in male collegiate athletes. *Journal of Strength and Conditioning Research*, 22(1), 226-229.
8. McBride JM, Triplett-McBride T, Davie, & Newton RU (2002). The effect of heavy versus light load jump squats on the development of strength, power, and speed. *Journal of Strength and Conditioning Research*, 16, 75-82.
9. Gourgoulis V, Aggeloussis N, Kasimatis P, Mavromatis G, & Garas G (2003) Effect of submaximal half-squats warm-up program on vertical jumping ability. *Journal of Strength and Conditioning Research*, 17, 342-344.
10. Vetter R. E. (2007). Effect of six warm-up protocols on sprint and jump performance. *Journal of Strength and Conditioning Research*, 21, 819-823.
11. Yetter M. & Moir GL (2008). The acute effects of heavy back and front squats on speed during forty-meter sprint trials. *Journal of Strength and Conditioning Research*, 22, 159-165.
12. Jones A. M., Koppo K., & Burnley M. (2003). Effects of prior exercise on metabolic and gas exchange responses to exercise. *Sport Medicine*, 33, 949-971.
13. McArdle, William D.; Katch, Frank I.; Katch, & Victor L. (2009). "Training for Anaerobic and Aerobic Power". *Exercise Physiology: Nutrition, Energy, and Human Performance* (7th ed.). Lippincott Williams & Wilkins. p. 483. Retrieved May 7, 2012





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Coach Shareen Png during pool and theory sessions.



# Relative Age Effect among Participants of the Under 12 Category of the Malaysian Schools Sports Council Athletics Championships 2012

## INTRODUCTION

Financial constraints have and will always be a bane to sports development. To optimize the utilization of these limited resources, organizations responsible for the development of sports are forced into the identification and development of promising athletes at an early stage of the athlete's development. The basis of selection of these young athletes, more often than not, is age group competitions. Age group competitions which set cut off dates to categorize athletes to provide a level playing field inadvertently create a situation which it tries to avoid in the first place. The consequential outcomes resulting from the disparity in age is referred to as relative age effects (RAE) [1]. This effect is most evident in the pre pubertal years where children go through the phase of growth spurt [7]. Thus, there is a marked difference between children born in the early part of a year (e.g. January) and children being born in the later part of the same year (e.g. December). RAE is not only prevalent in sports but can also be observed in academic environments [18].

In a review of studies conducted to investigate causal factors that contribute towards the biasness of selecting relatively older athletes in age group competitions; it was concluded that the age-qualification dates of age group tournaments is the major contributory factor of RAE [13]. Two soccer championships in Brazil and Germany noticed that a similar pattern of birth date distribution existed in these two countries despite differences in geographical location and social cultural practices [14]. Evidence for RAE emerged among soccer professionals in Australia; a corresponding shift in birth dates distribution among soccer professionals in Australia 10 years after the cutoff date was changed from 1st January to 1st August [14].

Maturational differences have also been attributed to the prevalence of RAE among young athletes [4]. At the prepubertal stage of development, variation in the growth rate and biological maturity is considerable. Early maturers possess greater height and body mass; perform better in sports or events that require power, speed and endurance [11]. In youth sports where the cut off dates remain unchanged over the years, relatively older athletes are able to outperform their peers due to these relatively older athletes experiencing the growth spurt earlier than the later maturers. Due to their superior performances, these athletes will be perceived as talented and consequently be selected for higher tiers in competition [15] and placed in developmental programs. This difference in chronological age when coupled with late maturation makes it challenging for a young athlete to compete [13].

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Young athletes in a same age group at the start line of a cross country race; notice the variation in height among the participants.

Being selected for higher tiers of competition avails the young athlete to better training facilities for practice and resources towards skill acquisition and expertise development. Thus, young athletes not selected would find themselves denied an opportunity to improve themselves towards better performances. The effects of RAE among young athletes contribute to an important, albeit, simple factor – playing experience. Due to the considerable difference (anthropometry and cognitive) among children born in the opposite ends of a calendar year; the earlier born child acquires an extra year of experience in terms of training and play time [12].

The incidence of RAE is more prevalent among sports that popular (e.g. soccer) when compared to less popular sports. RAE was not evident among French volleyball players a marginal sport with approximately 55,000 players in 2006 [6]. In the same study, a RAE trend was observed in high contact sports (rugby union, handball & soccer). Physical attributes which has been a high determinant for success in sports of this category would exhibit this RAE. In a study on the participants of the 2008 Junior Championships and 2009 Youth Championships; it was concluded that RAE excludes some talented young athletes and leads to a discontinuation of their sporting career [10]. The authors further stated this phenomenon might lead to a fall in the overall standard of performance and athletes quitting the sport before realizing their true potential.

Apart from the effect of RAE physical aspect of sports, the psychological maturity of young players is known to differ with respect to their chronological age. The difference in the level of neurological maturation can be observed in different capabilities such as self-regulation of attention, and other cognitive aspects such as memory [16], selective attention [11], metacognition [8] and inhibition control [2]. Children with a higher level of perceived competency were more likely to participate in physical activities [9]. An imbalance between the demands of competitive sports situations and a lack of ability may be too stressful to a child which consequently results in avoidance of physical activity [17].

The conclusions and suggestions from the aforementioned studies prompt an investigation into the distribution of birth dates among athletes competing in the under 12 category of the Malaysian Schools Sports Council Athletics Championships 2012 (MSSCAC 2012).

## METHODS

The data utilized for this study was obtained from the website ([www.mssmperlis.com](http://www.mssmperlis.com)) of the organizer of the National Schools Sports Council Athletics Championships 2012. This study considered the first of January as the cutoff date and considered three months as a quartile [23]. All the registered participants in the under 12 category of the MSSCAC were utilized as subjects for this study (n=200; males = 104; females=96). January 1st was utilized as the cutoff date as it is the age qualification date for the national schools sports championships in Malaysia. To investigate the birth date distribution among the medal winners, the birthdates of the competitors were divided into six month periods due to the smaller number of the medal winners (n=84; m= 42; f=42 ).

## RESULTS

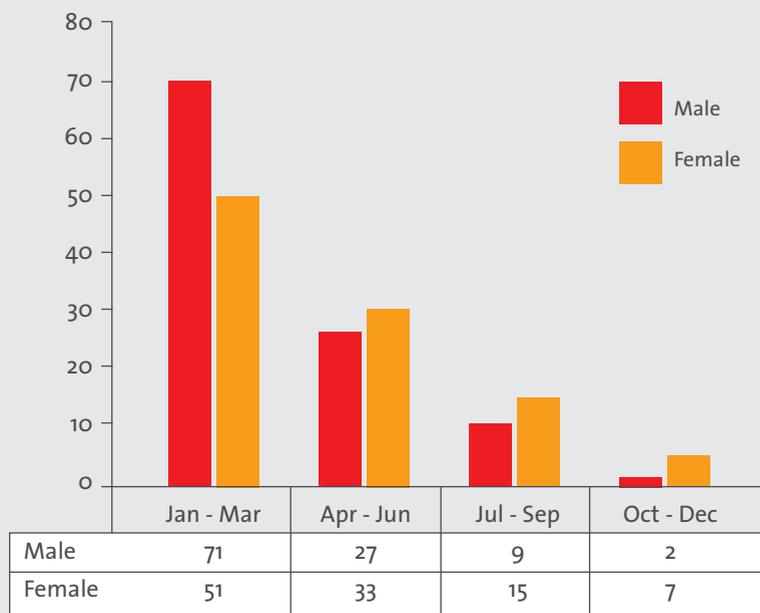


Figure 1  
Distribution of birth dates of athletes in the Under 12 category of the Malaysian Schools Sports Council Athletic Championships 2012

Figure 1 shows the descriptive data of the birth date distribution of the male and female athletes of the under 12 category of the MSSCAC 2012. As the figure shows that a large number of athletes were born in the first quartile (m =58.27%; f= 53.13%). The results showed there was a significant difference in the distribution of birthdates among the participants of the under 12 category of the MSSCAC 2012,  $\chi^2(3) = 141.112, p=.000$ . The significant differences was observed for both the male and female athletes (males:  $\chi^2 = 105.862, p = 0.001$  and females:  $\chi^2 = 43.585; [3]$ ).

Figure 2 presents the birth date distribution of the medal winners (n=84; m=42 & f = 42). All medal winners were considered separately as to maintain the number of medalists constant. Due to the smaller number of medal winners, their birthdates were divided in halves; January to June and July to December. The results showed there was a significant difference in the distribution of birthdates among the participants of the under 12 category of the Athletics Championships of the Malaysian Schools Sports Council 2012,  $\chi^2 = 23.048, p=.001; [1]$ . On closer inspection, it was shown that there were no winners from the final quartile (October – December) in both the male and female categories

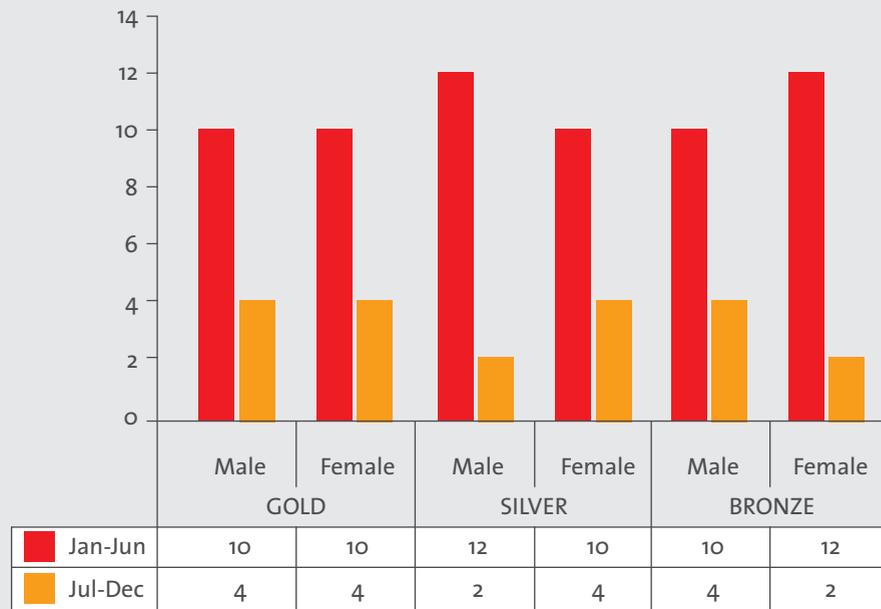


Figure 2  
Distribution of birth dates of medal winners in the Under 12 category of the Malaysian Schools Sports Council Athletic Championships 2012

## DISCUSSION

The objective of this study was to determine if the RAE was prevalent among athletes competing in the under 12 category of the National Schools Sports Council Athletics Championships 2012. It was hypothesized that there will be significant differences in the birth date distribution of the participating athletes in the under 12 category of the MSSCAC 2012. Data analysis showed that there was a significant difference in the distribution of the birthdates; with a high incidence of athletes born in the first quartile.

The utilization of chronological age categories to create a level playing field for young athletes has been used since the early days of organized sport. There is a large variability in the physical development especially among children in the prepubertal stage [19]. This variability manifests in the performance of various bio motor components such as speed, strength and endurance. The positive relationship between bio motor capabilities and success in sport has been seen in a number of studies since the early 90's [e.g. 3, 10, 21]. This led the researchers to attribute the prevalence of RAE among youth as solely a physical development influence. Later studies suggested that there were other factors that contributed towards RAE among young athletes.

Competition as a contributory factor of RAE was reaffirmed in this study. Studying the RAE among a few selected sports in France they concluded that competition was a contributory factor [6]. Athletics, which is based on the fundamental motor skills, enables every child to participate in its events. With a larger pool of athletes capable, the early maturing athlete who is faster and stronger dominates competitions thus denying a late maturing athlete a fair chance due to factors beyond his or her control.

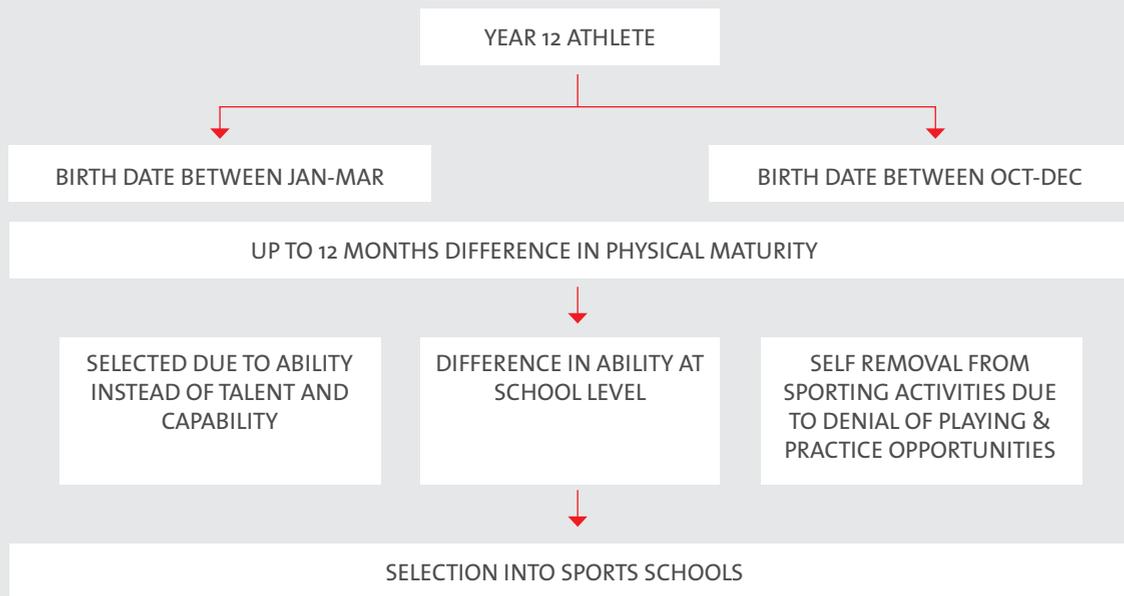


Figure 3  
Possible outcome due to selection of athletes during the prepubertal – pubertal stage.  
(Adapted from <http://www.sportsscientists.com/2009/01/matthew-effect.html>)

In the Malaysian context, the effects of RAE, especially among late specialization sports, has to be viewed seriously as the practical implications would (or already) effect the selection process of athletes to the national and state sports schools. The early selection of athletes, during the prepubertal/pubertal stage might help the early maturing athlete in realizing his or her true potential, but concurrently deny a late maturing athlete his or her rightful place on the podium. A talented athlete who has been denied access to facilities and organized development programs would find challenging to compete with his or her peers who have had the opportunity and accessibility to better facilities and full time coaches [4]. Figure 3 illustrates a possible outcome of the current practice of identifying and selecting talented athletes in late specializing sports (e.g. athletics) to sports schools in Malaysia.

## PRACTICAL IMPLICATIONS FOR COACHES

- Age group competitions should take into consideration the RAE before setting cutoff dates.
- Talent identification programs should take effects of maturation at the time of identification.
- Talent identification programs should not only consider physical attributes but also technical components necessary for achievement in sport.

## APLIKASI PRAKTIKAL UNTUK JURULATIH

- Pertandingan peringkat umur harus mengambil kira RAE sebelum menetapkan tarikh kelayakkan pertandingan.
- Program identifikasi bakat harus mengambil kira tahap kematangan fizikal semasa ujian identifikasi dilakukan.
- Pemilihan ke program perkembangan bakat harus mengambil kira faktor-faktor kemahiran dan bukan perkembangan antropometri dan keupayaan biomotor sahaja.

## REFERENCES

1. Baker, J., Schorer, J., & Cobley, S. (2010). Relative Age Effects: An inevitable consequence of elite sport? *German Journal of Sport Sciences (Sportwissenschaft)*, 1, 26-30.
2. Barnsley, R. H. and Thompson, A. H. (1985) Gifted or learning disabled? The age of entering school may make the difference. *Early Childhood Education* 18, 11-14.
3. Baxter-Jones, A. (1995). Growth and development of young athletes: Should competition levels be age related? *Sports Medicine*, 20, 59–64.
4. Bloom, B. S. (1985) *Developing talent in young people*. New York: Ballantine.
5. Delorme, N., Boiché, J., & Raspaud, M. (2009). The relative age effect in elite sport: the French case. *Research Quarterly for Exercise & Sport*, 80(2), 336–344
6. Delorme, N. & Raspaud, M. (2009). The relative age effect in young French basketball players: a study on the whole population. *Scandinavian Journal of Medicine & Science in Sports*, 19, 235-242.
7. Garner, R. (1991) Children's use of strategies in reading. In: *Children's strategies: Contemporary views of cognitive development*. In Bjorklund, D.F. Hillsdale (Eds). NJ: Erlbaum. 245-268 (English abstract).
8. Harter, S. (1993). Causes and consequences of low self esteem in children and adolescents. In R. Baumeister (Ed.) *Self esteem: The puzzle of low self regard*. New York: Plenum press. 87-116.
9. Hollings, S.C., Hume, P.A., and Hopkins W.G. (2012). Relative-age effect on competition outcomes at the World Youth and World Junior Athletics Championships, *European Journal of Sport Science*, DOI:10.1080/17461391.2012.713007
10. Malina, R., Bouchard, C., Bar-Or, O. (2004) *Maturation and physical activity*. Champaign, IL: Human Kinetics
11. Miller, P.H. (1991) The development of strategies in selective attention. In: *Children's strategies: Contemporary views of cognitive development*. Bjorklund, D.F (Ed). Hillsdale, NJ: Erlbaum. 157-184.
12. Musch, J. & Grondin, S. (2001). Unequal competition as an impediment to personal development: A review of the relative age effect in sport. *Developmental Review*, 21. 141- 167.
13. Schorer, J., Baker, J., Busch, D., & Wilhelm, A. a. (2009). Relative age, talent identification and youth skill development: Do relatively young athletes have superior technical skills? *Talent Development & Excellence* 1(1), 45-56.

16. Sherar, L. B., Baxter-Jones, A. D. G., Faulkner, R. A., & Russell, K. W. (2007). Do physical maturity and birth date predict talent in male youth ice hockey players? *Journal of Sports Sciences*, 25, 879-886.
17. Siegler, R.S. (1991). *Children's thinking*. Englewood Cliffs, NJ: Prentice Hall.
18. Smith, R.E. (1986). Toward a cognitive-affective model of athletic burnout. *Journal of Sports Psychology*, 8, 36-50.
19. Strom, B. (2004). Student achievement and birthday effects. Mimeo, Norwegian University of Science and Technology (online) (21 screens/inclusive page). Available from. Available from <http://www.hks.harvard.edu/pepg/PDF/event/Munich/PEPG-04-Strom.pdf>. Retrieved 1 February 2012.
20. Tanner, J. M. 1962. *Growth at adolescence*, 2nd Edition. Blackwell Scientific Publications, Oxford.
21. Verhulst J. (1992) Seasonal birth distribution of West European soccer players: a possible explanation. *Med Hypotheses*; 38: 346-8

**“WHEN THE COACHES OF TODAY TEND TO TEACH THE WAY THEY WERE TAUGHT IN THE PAST, HOW CAN WE EXPECT PROGRESS”**





# Important guidelines for coaches in dealing with wheelchair bound/spinal cord injured athletes

## INTRODUCTION

Wheelchair sport has grown tremendously since 1948 when Sir Ludwig Guttmann organized the first international sport competition for injured World War 2 veterans at Stoke Mandeville Hospital in England. What began as rehabilitation exercise has evolved into one of the world's largest multisport events the Paralympics Games. From a modest 400 athletes representing 23 countries at the first paralympic games in Rome in 1960, the modern summer paralympic games now attract about 4000 athletes from 150 nations. Since the participation of spinal cord / wheelchair bound athletes are increasing now days, it is important for the coaches to understand about the injury and its implications towards high performance training.

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## PARALYMPICS SPORTS WITH WHEELCHAIR BOUND / ATHLETES WITH SCI

- |  |                          |                       |
|--|--------------------------|-----------------------|
| a. Athletics – (track) wheelchair racing, (field) throwing events. | d. Equestrian            | j. Shooting           |
| b. Archery   | e. Wheelchair basketball | k. Rowing             |
| c. Boccia  | f. Wheelchair fencing    | l. Swimming           |
|  | g. Powerlifting          | m. Table tennis       |
|  | h. Sailing               | n. Wheelchair tennis  |
|  | i. Wheelchair rugby      | o. Sitting volleyball |

## ANATOMY OF THE SPINAL CORD

As indicated on the right side of Figure 1, the 33 vertebrae in the spinal column are divided into 5 types. There are 7 cervical, 12 thoracic, 5 lumbar, 5 sacral and 4 coccygeal vertebrae. Each vertebrae has a name that is derived from its type and its position relative to others. For example, the fifth cervical vertebrae are called C5, and the first lumbar vertebrae are called L1. The spinal canal below L2 is filled by loose bundle of spinal nerves collectively known as the cauda equina, which means 'horsetail'. The cord is organized into 31 spinal segments – 8 cervical, 12 thoracic, 5 lumbar, 5 sacral and 1 coccygeal. Each spinal segment has a pair of spinal nerves, one for the left side of the body, one for the right. The left side of figure 1 shows the spinal nerves that arise from each spinal segment, along with the main muscles that are innervated by the nerves [1].



### INJURY TO THE SPINAL CORD

The spinal cord can be damaged in a number of ways, including congenital malformation (example spina bifida), disease processes (poliomyelitis, cysts or tumors, meningitis), or injury. Majority of the athletes competing in wheelchair sport have a damaged cord such as a result of injury from events such as motor vehicle accidents, diving accidents, and high falls. Injury to the spinal cord can affect all three functions of the spinal cord –motor, sensory and autonomic.

- a. Voluntary motor functions – the cord transmits signals from the brain that are required for voluntary contraction of skeletal muscle. In general, the muscles of the arms and hands are innervated by the cervical segments, the trunk by the thoracic segments and the legs and feet by the lumbar and sacral segments.
- b. Sensory functions- a range of sensory information is transmitted from the periphery in the brain via the cord including tactile (touch), proprioceptive (location of the body in space), and deep-pressure sensations. Each area of the body sends tactile information to the brain via a specific spinal segment. In general, the head and arms send sensory information to the brain via the cervical segments, the trunk send information via the thoracic segments and the lower back and legs send information via the lumbar and sacral segments.
- c. Autonomic functions – autonomic functions are controlled by the autonomic nervous system (ANS). Autonomic functions include cardiovascular function (example heart rate, blood pressure), respiration, digestion, excretion, and thermoregulation (maintaining a constant body temperature in hot or cold conditions). The ANS controls these functions automatically with relatively little conscious control. For example heart rate increases automatically with exercise without requiring conscious thought.

### INJURY LEVEL

The higher the injury level (near to the brain), the more severe are the functions. The term tetraplegia- generally preferred to quadriplegia, which is also used to other health conditions and can be ambiguous –refers to people with an SCI at or above T1 because they have impaired movement or sensation in all four limbs as well as the trunk (tetra meaning four). Paraplegia refers to people with injury at or below T2 because they have normal strength and sensation in their head, neck and arms but impaired sensation or voluntary movement (motor) in their trunk and legs

## INJURY COMPLETENESS

In about 50% of cases, cord injuries do not interrupt all the connections between the brain and the segments below the level of the lesion [2]. This is known as incomplete injury. A person with in complete injury will retain some motor or sensory function below the level of lesion. Accurately how much function is preserved is determined by how much of the cord is damaged and which parts of the cord are damaged. People with incomplete injuries have more varying functional capabilities- people with injuries that are almost complete may have a tiny amount of sensation below the level of their lesion, but when more of the cord is preserved, they may be able to move their legs a little, stand up, walk or even run. The amount of movement and sensation that is retained depends on how many of the connections are broken. The table 1 below explains the main effects of SCI, the level of injury the effects are usually associated with and the implications for sport participation.

### PRESSURE SORE

Pressure sores are an important health concern for people with physical limitations. They are caused by several factors such as prolonged pressure exposure, shear force, compromised soft tissue over bony prominences, excessive moisture over skin, high temperature at the seating surface and impaired sensation. The development of pressure sores may be complicated by pain, infection, weight loss, immobilization and negative emotions and result in hospitalization [3]. Athletes need to stay healthy and continue their training programs and participate in competitions, but pressure sores interrupt training and competitions. Pressure ulcers also diminish performance capacity. Many factors also can be taken into account when dealing with pressure sores such as type of cushions, pressure distribution, weight of the athlete, stability of the cushion, and also light wheels tires and hand rims.

Table 1  
MAIN EFFECTS OF SCI

Effect	Associated with complete injury or above	Implication in sport
Reduced /absent movement in the hands and fingers	T1	Grasping and manipulating objects in difficult or impossible situations (example picking up objects)
Reduced or absent sitting balance	L1	Sitting without a backrest, reaching outside base of support, or using trunk to propel wheelchair is difficult/ impossible (example wheelchair basketball)
Reduced /absent ability to walk	S2	Use wheelchair for competitive sport
Reduced/absent sensation	Any level (when cord injury is complete, sensation is usually reduced/ absent below the level of the injury)	When collisions /falls occur, assess the seriousness of the injury by means other than pain; when trying new activities, be careful of knocks and rubbing on areas with reduced sensation.

Table 1 (cont)  
**MAIN EFFECTS OF  
 SCI**

<b>Effect</b>	<b>Associated with complete injury or above</b>	<b>Implication in sport</b>
Spasms	Any level (excluding injury to the cauda equina)	When an athlete changes position (example from sitting to lying on a bench), paralysed muscles below the level of the lesion may relatively contract, causing movement that the athlete cannot control. Type, size, duration, and forces of the contractions vary from athlete to athlete- some are not affected by spasms at all, whereas others have severe spasms.
Decreased maximal heart rate	T6	Heart rate is not a good indicator of exercise intensity, and some athletes will have a lower physical work capacity.
Exertional hypotension (decrease in blood pressure in response to exercise –in people without SCI, blood pressure usually increases during exercise).	T6	Care is needed when exercising.
Orthostatic hypotension (sudden drop in blood pressure when moving from lying to sitting or sitting to standing, especially if the movement is fast).	T6	Care is needed when moving into and out of exercise positions, especially if the exercises are new or the athlete has a history of orthostatic hypotension.
Autonomic dysreflexia (rapid, often dangerous increase in blood pressure that occurs when a stimulus that would usually be painful is applied to an area where the athlete does not have sensation)	T6	Some athletes deliberately induce this response to enhance performance, commonly referred to as boosting; however, its use is both dangerous and illegal in Paralympic sport.

Table 1 (cont)  
**MAIN EFFECTS OF SCI**

<b>Effect</b>	<b>Associated with complete injury or above</b>	<b>Implication in sport</b>
Reduced /absent sweat response.	Any level (when cord injury is complete, the ability to sweat is usually absent below the level of the injury).	Difficulty losing heat in hot weather.
Reduced/absent shivering response and piloerector response (goose bumps).	Any level (when cord injury is complete, the ability to shiver and get goose bumps is usually absent below the level of the injury).	Difficulty to retaining heat in cold weather.
Reduced/absent ability to void bladder or bowels.	S4	Usually minimal impact because most athletes have independent bowel and bladder management strategies (example use urine bag).

**PHYSIOLOGICAL RESPONSES AND SCI ATHLETES**

Some special considerations need to be look into when training the SCI/wheelchair bound athletes in sports. Some of the important points are highlighted here.

**HEART RATE**

During exercise, heart rate increases due to reduced activity of the vagus nerve (which normally restrains heart rate) and increased activity of the sympathetic nervous system (which normally accelerates heart rate). Nondisabled athletes are able to increase their heart rate until their maximum level (220-age), although this is lower for arm exercise. All sympathetic nerves originate from the thoracic and lumbar sections of the spinal cord. The nerves that allow the heart rate to increase exit from the spinal cord between the first and the fourth thoracic vertebrae (T1 and T4). Therefore as the muscle innervations, athletes with spinal cord lesions within this area most likely will not be able to increase their heart rate to those as same as the nondisabled athletes. Furthermore, athletes with injuries above this level will not be able to increase their heart rate much above the natural rhythm of the heart, which is approximately 100 beats per minute. For tetraplegic athletes, heart rate may not be the best indicator of training intensity.



### STROKE VOLUME AND CARDIAC OUTPUT

Stroke volume is the amount of blood ejected from the left ventricle with each heart rate beat, whereas cardiac output is the amount of blood ejected from the heart via the left ventricle in 1 minute. For nondisabled athletes, stroke volume is a key adaptation to endurance training and generally increases with training. Goodman, Liu & Green [4] did expose that stroke volume during exercise can increase by 7 to 10% after only 6 days of endurance training. During exercise of gradually increasing intensity (incremental exercise), stroke volume initially increases with exercise intensity up until 40 to 50% of maximum exercise capacity due to more blood being returned to the heart from the venous circulation and more forceful contraction of each heart beat [5]. This allows more oxygenated blood to be delivered to the exercising muscles. As the size of the left ventricle increase with endurance training, maximal cardiac output also increases.

Maximal values for stroke volume and cardiac output are reduced in athletes with SCI compared with nondisabled athletes. Stroke volume is often reduced because the loss of sympathetic nervous system activity below the level of injury does not allow blood to be redirected as effectively from non-exercising areas. So, less blood can return to the heart with each beat. The reduction in cardiac output may be from this alone or in combination with a reduction in the maximum heart rate obtainable.

### AEROBIC FITNESS

During incremental aerobic exercise, oxygen consumption for nondisabled athletes' increases with exercise intensity until a maximum value is determined. This classical statement been exposed many times in most exercise physiology textbooks is that with any further increase intensity from this point, there will be no further increase in oxygen uptake, resulting the term maximal oxygen uptake or  $VO_2$  max. During upper body exercise or modes of exercise such where local fatigue occurs before central cardiorespiratory fatigue, such as plateau is not achieved as often and the term peak oxygen uptake or  $VO_2$  peak, although it still represents a maximal effort.  $VO_2$  peak is determined by many factors, especially the amount of muscle mass that can be exercised, maximal cardiac output, and the amount of oxygen that can be delivered, extracted, and used by the body.

## ANAEROBIC FITNESS

Just as aerobic fitness parameters increase with lower levels of SCI, peak anaerobic parameters show a similar response. As peak anaerobic power relates to sprint activities, values are greater than for incremental aerobic exercise tests and are again greater where more muscles can be recruited for power production. As a result, blood lactate values are also greater after a sprint test where greater peak anaerobic power output is achieved. A standard lab-based exercise test to determine peak anaerobic power production is the Wingate anaerobic test, which can easily be adapted for wheelchair exercise, or arm cycling. This test involves a load being suddenly applied to an arm-crank ergometer or wheelchair roller system with an athlete being exercise as hard as possible for 30 seconds. In general, if we compare the profile of a nondisabled athlete with a wheelchair athlete, greater differences occur as less functional muscle mass becomes available.

## SOME USEFUL TIPS FOR THE COACHES:

- a. The athlete and coach should discuss the athlete's trunk stability or balance prior to participating in any new drills or skills. Generally the higher the level of SCI, the less balance the athlete has.
- b. Experiment with different types and positions of strapping to improve trunk stability.
- c. For weak grip, consider using gripping aids such as strapped gloves to help perform arm cranking.
- d. For wheelchair pushing, it is important to include other forms of exercise in a training programme, such as hand cycling and swimming to reduce likelihood of shoulder injuries from overuse.
- e. People with tetraplegia may have problems with muscular endurance. It may be advisable to reduce the number of repetitions and ensure additional recovery.
- f. It is also advisable to keep a training log book so that you can track your training. For example, when your athlete achieved a good performance, it may be due to the good training programme.
- g. Also must check the type pressure is at its usual competitive level and noted.
- h. Any changes in wheelchair configurations are noted.
- i. Body mass of the athlete is measured (to see if the body mass may have influence rolling and pushing resistance).

## CONCLUSION

A sport wheelchair should be configured in a way that minimize rolling resistance, maximizes maneuverability, provides adequate stability of the user and the wheelchair, increases hand-rim accessibility, and prevents injuries. Maintaining proper body weight also can lessen the forces experienced through the upper extremities during propulsion. Although athletes with different levels of injury differ in their maximal exercise responses, the principles of training are the same as for nondisabled athletes. As athletes progress with training, they should discuss their training needs with a coach to produce a periodization plan. This will help to maximize performance and prevent overtraining.

### PRACTICAL APPLICATION FOR COACHES

Coaches need to be aware about their ability to perform in skill and drills. Understanding their physiological capabilities will help coaches to overcome minor problem and more focus in their training session. Coaches also can utilize their strength to achieve maximum potential.

### APLIKASI PRAKTIKAL UNTUK JURULATIH

Jurulatih perlu sentiasa waspada dan mengambil berat mengenai kemampuan atlet mereka untuk menjalani kemahiran dan latih tubi. Memahami kemampuan dari aspek fisiologi mereka mungkin boleh membantu dalam mengatasi masalah-masalah kecil dihadapi seterusnya menumpukan kepada sesi latihan. Jurulatih juga boleh mengeksploitasi kekuatan mereka untuk mencapai potensi maksimum.

### REFERENCES

1. Goosey-Tolfrey, V.L. (2010). Wheelchair sport: A complete guide for athletes, coaches and teachers. Champaign, IL: Human Kinetics publishers.
2. Ackery, A., Tator, C. & Krassioukov, A. (2004). A global perspective on spinal cord injury epidemiology. *Journal of Neurotrauma*, 21(10), 1355-1370.
3. Consortium for Spinal Cord Medicine (2000). Pressure ulcers prevention and treatment following spinal cord injury: A clinical practice for health-care professionals. Washington, DC: Paralyzed veterans of America.
4. Goodman, J.M., Liu, P.P. & Green, H.J. (2005). Left ventricular adaptations following short-term endurance training. *Journal of Applied Physiology*, 98(2), 454-460.
5. Hopman, M.T. (1994). Circulatory responses during arm exercise in individuals with paraplegia. *International Journal of Sports Medicine*, 15(3), 126-131.



### CONTINUOUS COACH EDUCATION (CCE)

## WHAT IS CCE?

CONTINUOUS COACH EDUCATION (CCE) REFERS TO FORMAL COURSES AND SEMINARS THAT TEACH SKILLS DIRECTLY RELATED TO THE COACH COMPETENCIES, PERSONAL DEVELOPMENT, DEVELOPMENT OF COACH'S PRACTICE AND OTHER SKILLS OR TOOLS THAT ARE RELATED DIRECTLY APPLICABLE TO COACHING.

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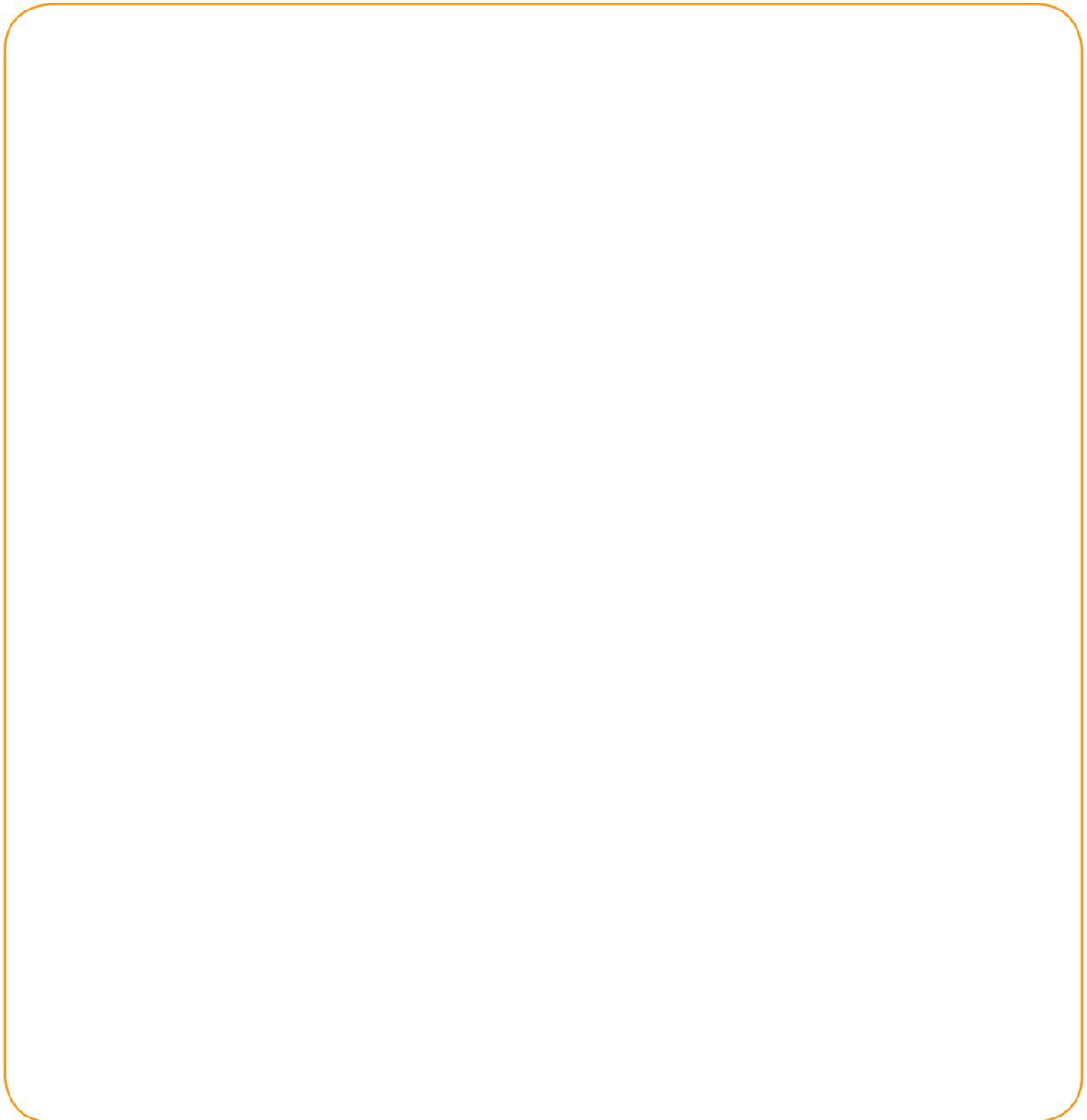
MONTH	NO.	COURSES	DATE	ORGANISER (IPTA/STATE SC)	VENUE
Mac	1	FACE (Asas) Siri 02/13 - Sports Massage	29 - 30 Mac	Majlis Sukan Labuan	Palm Beach Resort & Spa, Labuan
Apr	2	BCE Siri 01/13	12 - 14 Apr	UPSI, Perak	UPSI, Tanjung Malim, Perak
	3	FACE (Asas) Siri 03/13 - Nutrition	TBA	MSN Sabah	Kota Kinabalu, Sabah
Mei	4	FACE (Asas) Siri 04/13 - Sports Injuries (Othopaedic)	11 Mei	MSN Swak	Bintulu, Sarawak
	5	FACE (Asas) Siri 01/13 - Functional Training	TBA	IKIP, Pahang	IKIP, Pahang
Ogos	6	FACE (Asas) Siri 05/13 - Functional Training	24 Ogos	USM, Kelantan	USM, Kelantan
Sept	7	FACE (Asas) Siri 06/13 - Functional Training	10 Sept	UniMAP, Perlis	UniMAP, Perlis
	8	FACE (Asas) Siri 07/13 - Nutrition	21 Sept	UniSZA, Trengganu	UniSZA, Trengganu
Okt	9	BCE Siri 02/13	9 - 11 Okt	IPGRM, N. Sembilan	IPGRM, N. Sembilan
	10	FACE (Asas) Siri 08/13 - Functional Training	24 Okt	Bukit Jalil	Bukit Jalil
Nov	11	FACE (Asas) Siri 09/13 - Functional Training	14 Nov	MSN Johor	Johor Bahru, Johor
Dis	12	ACE Siri 01/13	29 Nov - 1 Dis	MSNM	Bukit Jalil

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# MY AUTOGRAPH

Take a break and pen your thoughts





## LATAR BELAKANG

CORAK SAUJANA SDN BHD DITUBUHKAN PADA 1999. KAMI ADA LEBIH DARI 10 TAHUN PENGALAMAN DALAM BIDANG PERCETAKAN DARI SEGI KUALITI, KECEKAPAN DAN HARGA YANG BERPATUTAN. SYARIKAT KAMI MERANGKUMI PENGENDALI-PENGENDALI MESIN DAN PENGURUSAN BUMIPUTERA.

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SYARIKAT KAMI MENAWARKAN JENIS-JENIS PERCETAKAN BERIKUT

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### • PERCETAKAN KHUSUS

(untuk pelbagai acara & promosi, etc)  
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Kotak carton, Kotak hadiah, Kotak bermagnet, Rak-rak e-flute berdiri

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