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**PERSONALITY AFFECTING COACHES-ATHLETES RELATIONSHIP  
OF MALAYSIAN FOOTBALL TEAMS**

Abbylolita Sullah

*Faculty of Sport Science and Recreation,  
Universiti Teknologi MARA Sarawak*

Chee Hian Tan

*Faculty of Sport Science and Recreation,  
Universiti Teknologi MARA Shah Alam Selangor*

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*Correspondents Author,*

**Abbylolita Sullah**

**Abbylolita\_12.yahoo.com**

**012-8590283**

**Faculty of Sport Science and Recreation,**

**Universiti Teknologi MARA Sarawak**

## Personality Affecting Coaches-Athletes Relationship of Malaysian Football Teams

Abbylolita Sullah<sup>1.</sup>, & Tan Chee Hian<sup>2</sup>

<sup>1</sup>Faculty of Sport Science and Recreation  
Universiti Teknologi MARA Sarawak

<sup>2</sup>Faculty of Sport Science and Recreation  
Universiti Teknologi MARA Shah Alam

### Abstract

*Personality has a great effect on performance and coach-athlete relationship in a team. Sports scientist asserts that a lack of certain personality traits could help to explain “why some individuals gifted at sport do not thrive at elite level.” Therefore, the purpose of this study was to examine any differences of personality traits between coaches and players of Malaysian football teams as well to identify any differences concerning to personality traits among Malaysian successful and less successful football teams. (n =16) coaches and (n = 200) players of the Malaysia Super League and Malaysia Premier League were identified to participate in the modified GEQ (2009) which measured personal attributes and personal qualities. Independent t-test apply and the results indicated that the null hypothesis was rejected with the statistically of n (214); t = 2.441, p = .015; <.05 and n (214); t= 2.434, p = .020; <.05. Personal qualities and attributes showed significant high mean value for Malaysian successful football teams n (106); t = 4.947, p = .000; <.05. This study distinguished personality traits that seem to set apart the successful high-performing coach and athletes. This study has contributed to Coaching Science, the body of knowledge.*

### Introduction

Sabah head coach, Jelius Ating highlighted the success of Sabah FA after claim first title in 23 years. “I joined Sabah at a time when things were not well with the team, so I had to introduce changes and re-teach football to the players. They have to have the desire to succeed and be good players, because victory begins with them. I am by no means an accomplished coach, but I worked on their character and mentality”.

Earlier research has established that interaction processes between coach and athlete endure basic components of the development of both groups’ performances. Coaches continuously structure evaluations about players based on several variables and frequently seek out ways to improve the quality of those relationships to optimize the talent of each player. However, an ample knowledge and skill needed to supervise an athlete's potential development. For this reason, Barić (2007) claimed that declared coach was one most important factor that affected athlete's development and progress. The characteristic of the coach, the competition experience, the experience in the sports preparation process, competition success achievement, and ability to transfer knowledge had important influenced on the accomplishment of an individual athlete in selected sport. Ogivile and Tutko (1971) also founded that when coaches were asked to rate personality traits of their players, the coaches were

perceptive in identifying of personality tendencies which were significant part of their own character structures.

While coaches were constantly making appraisal about their athletes, athletes as well formulated assessments about their coaches' personalities and behaviours (Cratty, 1983). Over these years, coaches did not interest in their athletes' perceptions of them. However, as player's drive has become a factor in team performance, the evaluation of coaches and interest in athletes' perceptions of coaches had become fundamentals in verifying maximum coaching effectiveness and achievement (Jubenville, 1999). If coaches comprehended the opinions of athletes concerning coaching roles, coaches were then arranged to adapt their coaching styles to improved team unity and bring out athletes to more competitive spirit (Weiss & Fredrichs, 1986). It was interesting to note any differences of personality traits between coaches and players as well to know what could be outcome of the personality traits of successful football teams were differing from those of less successful football teams.

### *Personality Variables*

Individual characteristics and the outcome have always been the strongest factors to affect the relationship between coaches and players. Individual characteristics have been paid the greatest amount of attention in the research. The characteristics of experience and maturity (Chelladurai & Carron, 1983), motivation and cognitive structure (Chelladurai & Carron, 1981; Erle, 1981) have been examined. The outcomes, as operationalized by satisfaction and performance, have been investigated with reference to type of task (open, closed), player status (starters versus substitutes) and coach status (Chelladurai, 1978; Horne & Carron, 1985).

In 1971, Ogivile and Tutko had found that coaches had unique personality traits different from their athletes. It appeared that major difference between personality of the coach and the athletes may lead to discipline problems within the teams. Hence, Vealey (1992) suggested there may be more benefit in studying personality by investigating self-worth, perceived ability and achievement goal orientation of the coach and athlete.

### *Personal Attributes and Personal Qualities*

Academics around the world have sought to express a definition about the nature of the education they offered to players through a description of the standard qualities and skills that players should possess. In past studies, both the United Kingdom players and players across Europe ranked personality, including personal attributes and personal qualities as the most important criterion in getting a position.

Personal attributes are the qualities, skills and understanding community agrees its players should develop during their time with the academy and consequently shape the contribution which they are able to make their profession and society. Whereas, the personal qualities of these football players were refer to speak effectively; write effectively; independent learning; computer skills; mathematics skills; research skills; develop self-confidence; work independently; provided leadership skills; conflict resolution skill; knowledge of political/social issues and well-versed knowledge of other cultures.

Players who self-assessed their profession experiences would start to fill the gaps of how coaches serve players, and what players face and what were their feelings after they have further their profession. Hence, it should lead to a clear picture of how players in reality relate to coaches' style about what is happening in the games and how players respond to their situation. Coaches' points of

view require players to be “adaptable”, “adaptive”, “transformative”, and “flexible” (Harvey et al, 1997).

### *Purpose of Study*

The purpose of this study was to examine any differences of personality traits between coaches and players of Malaysian football teams as well to identify any differences concerning to personality traits among Malaysian successful and less successful football teams.

## **Methodology**

### *Participants*

The samples in this study comprised of a total of two hundred football players from four different teams in the Malaysia Super League (n = 100) and four different teams in the Malaysia Premier League (n = 100) based on the classification of less successful and successful football teams. It also consisted of data from sixteen coaches, (n = 8) from successful teams and (n = 8) were from less successful teams. This would indicate that the samples in the present study was closely representative of the population of Malaysia football players being investigated.

### *Instrumentation*

The questionnaires to measure an independent variable was constructed by adopting items from Employability of Sport Science Graduates of Malaysian Public Higher Education Institutions, the Graduate Employability Questionnaire – GEQ (Chee Hian Tan, 2009). The original version of GEQ consists of five parts - demographic profile, personal attributes, personal qualities, students’ satisfactory survey and competency of Sport Science Program/Courses.

However, for the purpose of this study, only the adopted version of personal attributes and personal qualities would be used, which helped to identified coaches’ and players’ personality traits. Perhaps GEQ (2009) had publication on - line in academic journal Malaysian Journal of Sport Science and Recreation (MJSSR) 2014 which was constructed high validity that assess two different aspects or dimensions of personality traits, namely personal attributes and personal qualities in this study.

The personal attributes and personal qualities consisted of 27 items and divided into 15 statements or factors of personal attributes and 12 statements or factors on personal qualities respectively and were highly reliable with Cronbach’s alpha of .882 and .831.

### *Procedures*

The football associations identified were contacted via mail, email and phone. Respondents were brief on the purpose of the study and were encouraged to participate in the study. Permission was granted by Football Association of Malaysia (FAM) and each state football association that were involved, and the appointment for on-site data collection was confirmed at least one week in advance. On the day of data collection, informed consent was obtained from the coaches and players. The respondents were briefed again on the purpose of the study. Prior to questionnaire administration, the respondents were assured that their participation in the study was completely voluntary, and that respondents may withdraw at any time without penalty. Data were collected using self-administered questionnaires and monitored by helpers. All the respondents completed the questionnaires within half an hour.

## Results

This study had explicitly generated the hypotheses and t-test was used in the analysis. The null hypothesis examined if players' personality traits were different from their respective coach's personality traits. After analysis of t - tests for both variables (personal attributes and personal qualities), it showed that the coaches and players were significantly differed. The null hypothesis was rejected with the statistically of n (214); t = 2.441, p = .015; <.05 and n (214); t= 2.434, p = .020; <.05. It concluded that there was a significant difference between the personalities traits between players with the coaches, the results were presented in Table 1.

*Table 1: Differences in the Personality Trait Variables by Coaches and Players of Malaysian Football Teams*

Variables	Coaches		Players		t-value	Sig.
	Mean	SD	Mean	SD		
Personal Attributes	4.38	.214	4.21	.282	2.441	.015*
Personal Qualities	4.43	.353	4.21	.365	2.343	.020*

This study exclusively intended to retort if there any significant differences in the personality traits (personal attributes and personal qualities) between Malaysian successful football teams and Malaysian less successful football teams (Malaysia Super League and Malaysia Premier League). The null hypothesis could be generated as an independent sample t-test was conducted. Based on the findings, there was significant difference in mean score of Malaysian successful football teams and Malaysian less successful football teams n (106); t = 4.947, p = .000; <.05. The null hypothesis was rejected. As the results, both Malaysian successful and less successful of football teams showed highly differ in personal qualities but not personal attributes as personality traits was concerned, the results were presented in Table 2.

*Table 2: Differences in the Personality Trait of Malaysian Football Teams*

Variables	Successful		Less successful		t-value	Sig.
	Mean	SD	Mean	SD		
Personal Attributes	4.18	.231	4.26	.321	1.964	.051
Personal Qualities	4.10	.322	4.34	.374	4.947	.000*

## Discussion

### *Personality traits between players and coaches of Malaysian football teams*

One of the most asked question by sport scientist was 'does the personality traits of the coach differ from players and other coaches?' The first hypothesis examined if players' personality traits were different from their respective coaches' personality traits.

The findings of this study found that there was significantly differences in mean score of Personal Attributes and Personal Qualities among players' and their coaches. It concluded that there was significant difference in mean score between the personality traits of the players to those of their respective coaches. Personal attributes featured quite prominently among the candidate predictors of such transition, largely based on the growing evidence of the role personality plays in a range of important life outcomes such as sport and exercise related behaviour (Aidman & Schofield, 2004; Auweele et al., 2001; Silva & Weinberg, 1984; Vealey, 1992).

Personal quality was a psychological system that creates the person's characteristics. In fact that coaches showed consistent tendency to behave in a certain way. It concerns with how coaches behave in front of players, this was the first study to evaluate coaches and players on the personality traits. These findings were consistent with Ogilvie and Tutko (1971) which found that coaches and athletes do have difference and unique personality traits. A significant contribution to coaching science that it was a personal awareness of one's strength and weakness in terms of psychological structures (Ogilvie & Tutko, 1971).

Perhaps reasons for the higher ratings in both personal qualities and personal attributes for the coaches could be coaches used to have a relatively high desire for achievement. The need for achievement is an important motive among effective coaches. Successful coaches identified actions necessary to complete tasks and obtained results. In order to work their way up to the top of the team, coaches must full desire to complete challenging games and league. For example, organize and motivate players to accomplish goals while creating a sense of order and direction, this allows the coach to gain technical expertise; both through education and work experience as well establish a process for activities that lead to the implementation of systems, procedures or outcomes.

It was clear that leadership was a very demanding activity and that one's coach vital qualities to have advantage over the players who lack these qualities. According to Hargrove (1988) talented coaches showed a great range of skills and vary them to match changing situations. For instance, conflict resolution skills; in conflicts the coaches know how to control themselves and seldom manifest aggressive behaviour, know speak effectively, have good research skills and encompass self-confidence; which plays an important role in decision making and in gaining players' trust. Apparently, if the coach was not assured of what verdict to say or expressed a high degree of doubt, then the players were less likely to trust the coach.

#### *Personality Traits between Malaysian Football Teams*

An account of personality factors in distinguishing between successful and less successful football teams. The second hypothesis to examine if successful football teams' personality traits were different from less successful football teams' personality traits. The results demonstrated both successful and less successful of football teams showed highly difference in personal qualities but not the personal attributes as far as personality traits were concerned. Conceptually, these results were consistent with the notion of personality as a key factor in converting skills into achievement (Auweele et al., 2011). At any given level of ability, personality was likely to determine the style and quality of application of this ability and thus the ultimate success.

The concept of personality rests on the observation that individuals seem to behave somewhat consistently over time and across different situations, and from this perceived consistency comes the notion of "personality traits" that characterise individuals' regular ways of responding to their sports competition (Passer & Smith, 2001). Clearly, effective coach-athlete relationship was characterized by mutual trust, confidence in each other's abilities, good communication, especially good listening skills and a sense of collaboration or working together as a team.

## Conclusion

In summary, partial of Graduate Employability Questionnaire (GEQ) that used in this study were personal attributes and personal qualities dimensions which helped to identify coaches' and players' personality traits. The overall personal readiness for the original GEQ was highly Cronbach alpha value of .856 and this indicated that these factors highly reliable and valid to be considered as one of the independent variables in the recent study.

The main goal of recent study was to identify the differences of personality traits between players and coaches of Malaysian football teams and to identify the differences of personality traits between Malaysian successful and less successful football teams. A review of the literature suggested that there was a considerable gap between personality theories that were unsuccessfully applied to sport in efforts to understand personality traits and behaviours that predicted leadership effectiveness (e.g. Danielson, Zelhart, & Drake, 1975; Hendry, 1969; Lenk, 1977; Ogilvie and Tutko, 1966; Penman, Hastad & Cords, 1984; Tutko & Richards, 1971). This gap between these theories are vital to be studied.

The findings revealed that players viewed their coaches as someone who was always ready to provide support and enjoyable to work with. Marten (1975) stated that being a successful coach was an enormous challenge. Successful coaching was much more than just winning. Successful coaches helped athletes master new skills; enjoyed competing with others and feel good. Successful coaches did not only well verse in the skills of their sport, but also be the role model of those skills needed for successful achievement.

Finally, personal qualities in sports were strongly motivated by the ability displays to perform excellently. Therefore, the needs of the skill in sports were significant for social development and players understanding and that was why the personal qualities were rated higher than personal attributes among successful and less successful of Malaysian football teams. Through an analysis of personality traits and the events in which coach-athlete relationship demonstrated, athletes are likely to have friendly relationships with coaches. The enjoyment in learning and interacting atmospheres are important. For successful team players, this means feeling part of the team and knowing a valuable role. Approach in the study of personality traits outlined simple understandings of coach-athlete relationship and it allowed for further elaboration and subtle investigation.

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## COACHING INTERVENTION INDICES AS PREDICTORS OF EFFECTIVE COACHING AMONG NIGERIAN COACHES

O. A. Adegbesan, A.S Chidi, O. M. Jaiyeoba

*University of Ibadan, Nigeria*

*S. Mohammed Nigeria Football Federation, Nigeria*

*G. U. A. Ekpo Ignatius Ajuru University, Nigeria*

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### **Correspondents Author:**

**Olufemi A. Adegbesan,  
Exercise and Sport Psychology, Dept of Human Kinetics & Health Education  
University of Ibadan, Oyo State, Nigeria.  
Phone: +234171910144/+2348036870535  
E-mail: dokitafemi@yahoo.com**

## Coaching Intervention Indices as Predictors of Effective Coaching among Nigerian Coaches

*O. A. Adegbesan, A.S Chidi, O. M. Jaiyeoba  
University of Ibadan, Nigeria*

*S. Mohammed Nigeria Football Federation, Nigeria  
G. U. A. Ekpo Ignatius Ajuru University, Nigeria*

### Abstract

*The purpose of this research was to investigate on coaching intervention behaviors as predictors of an effective coaching. It was a descriptive research design and correlation type study to gain an in-depth understanding of the participants' views on the coaching intervention and effective coaching practice variables. Participants for this study were 50 male and 34 female athletes with mean age (mean = 24.52; SD 9.4). Athletes with sport involvement liked athletics, judo, swimming, volleyball, handball and table tennis. The measures used were Perceived Coaching Intervention Questionnaire ( $r = .84$ ) and Effective Coaching Scale ( $r = .79$ ). The results showed positive correlations between Effective Coaching and Encouragement ( $r = .514, p < .05$ ), Technical Information ( $r = .614, p < .05$ ), Negative Feedback ( $r = .591, P < .05$ ) Positive feedback ( $r = .585, p < .05$ ). 46.9% of the variance in the dependent variables was explained by four predictor variables when taken together. Conclusively, it was identified that positive feedback was the most potent from the four interventions as perceived by the athletes. The recognition of these excellent intervention coaching practice along the various sporting pathway would supports developments in models and frameworks for sport in Nigeria and globally.*

**Keywords:** *Coaching Intervention, Effective Coaching, Nigerian Coaches.*

### Introduction

Coaches through actions, speech and presence according to Jowett and Cockerill (2002) were very instrumental in an athletes' psychosocial and physical development. Indeed, coaches were influential leaders and there was evidence that child athlete's rates positive evaluation from coaches as more important than parental evaluations (Smith, Smoll and Smith, 1989).

Coaching as a dynamic and systematic process involved a number of processes which included observation, assessment, development of programmes, implementation of programmes, as well as reassessment. The coach in the opinion of Jones et al (1993) was placed in the role of a leader with many specific roles to play in the life of an athlete. Whatever type of sport, an athlete was involved in, the coach could have a significant impact on the life of the athletes (Baker, Yardley and Cote, 2003).

Effective coaching in this study was operationalized as the planned intervention by the coach designed to improve the performance of an athlete with emphasis on specific task and relationship. These

could be informal and formal to the athletes. Informal coaching was a daily management activity during which coaches encourages an athlete to try out a new skill while providing advice, guidance, help and encouragement. While the formal coaching was the coaches sets aside some time to work with athletes to help them developed or improved a specific skill in a structured way.

Several interventions by coaches had been shown to have a considerable impact on athletes. These interventions consisted of positive feedback, verbal reinforcement for skilled action, encouragement or comments that the athlete could be successful, technical information or advice about to improve action and criticisms or negative feedback following mistakes (Gallucci, 2008). Studies have lend credence to the fact that coaches who provided more positive feedback and encouragement following mistakes supported the development of higher general self-esteem among their male players and coaches who provided more technical instructions or instrumental support encouraged higher levels of athletic self-esteem (Smoll and Smith, 1989; 1990).

Several differences in responses to coaches been effective here been recorded for athletes in literature. For example, competitive swimmers have perceived competence, success and enjoyment as products of interactions with their coaches when the coaches provided them with technical information after desirable performances (Black and Weiss, 1992). Praise did have an appreciable influence on their perceived competence, success and enjoyment. This same group of swimmers according to Gallucci (2008) perceived competence, success and effort to be real when the coaches use the combinations of technical information, praise and criticisms.

There was widespread recognition that effective coaching was a critical element in any highly performance sports system and it was also integral to the delivery and development of high quality sporting experiences that inspire people of all ages to get involved and develop through sport. Despite this interest in quality coaching, a clear understanding of what excellence and effective coaching practice is or should look like is yet to be established. Cross (1995) suggested that there was no ideal model of coaching practice, even for the narrowly focused high performance level which was the focus of his research. Furthermore, Cross contended that many factors affect the type of coaching process that be most appropriate at any time. Despite the recognition of the complexity of the coaching process (Lyle, 2002), researchers have continued to examine coaching behaviours and practice. Through this study, researchers had described coaching behaviours of successful coaches (e.g., Becker & Wrisberg, 2008; Cushion & Jones, 2001; Gallimore & Tharp, 2004; Smith & Cushion, 2006) and effective coaching behaviours of expert coaches (Cote & Sedgwick, 2003; Cross, 1995; Dowdell, 2010).

It has been theorized that for a coach to be seen as effective, one's must possess certain personality traits. The trait theory suggested that effective coaches possess certain personality characteristics that make them ideally suited for leadership no matter the situations they found themselves in Weinberg and Gould, 1999. These traits which were considered stable personality dispositions are intelligence, assertiveness, independence and self-confidence.

Ghiseli (1963) in an earlier study reported other personality traits associated with effective leadership. These were the ability of the respondents to imitate action independently, and that self-assurance was related were those to respondents' hierarchical position within the group. Also, effective leaders exhibited individuality. A review of literature showed that when various theories of this nature were applied to the sport setting, training for competitiveness, providing social support and being rewarded were identified as the behaviours of coaches most desired by athletes when the coaches were rated.

Chelladurai and Salleh (1980) conceptualize training and instruction leadership as a task-oriented dimension of coaching behaviour aimed at improving athletes' performance through an emphasis on

training, teaching specific skills and coordinating activities. Social support which is motivation-oriented captures coaching behaviour that demonstrates a care for the personal welfare of the athletes and includes the creation and maintenance of a positive group atmosphere and emphasis on interpersonal relations. Positive feedback leadership, another motivational oriented dimension refers to coaching behaviour that reinforces the athlete by recognizing and rewarding good performance.

Coaching has a long history which can be traced back to Socrates, who believed that individuals learn best when they have ownership of a situation and take some form of personal responsibility for the outcome. Coaches in recent times have played a role in sport, especially when the act is effective as an important determinant of athletes' experiences in sport. Despite the importance and responsibility of the roles play by coaches as outlined in literature there exist little in research in Nigeria on how the athletes perceived them as effective leaders especially when some common interventions seen as coaching behavior are applied on the athletes' sport experiences and which perceived coaching behaviours relate to athletes perception of coaching effectiveness? It is in the light of this that this study investigated the athletes' perception of coaching intervention indices as predictors of effective coaching in Nigeria.

## **Method**

### *Participants*

The participants in this study were 50 male and 34 female professional athletes sampled proportionately with mean age (mean = 24.52; SD 9.4). Their involvements are athletics, judo, swimming, volleyball, handball and table tennis. 30.0% of the athletes (25) had paying experience of (1-3 years); 62.0% of the athletes (52) had playing experience of (4-7 years); while 8.0% of the athletes (7) had years of playing experience of 8-10 years.

### *Procedure for Data collection*

The ethical approval to conduct the study was obtained from the appropriate authority, while the consent of the athletes to participate in the research were sought through the consent form filled and signed by the athlete that volunteered to participate in the research. The content of the instrument were explained to them before the data was collected.

### *Measures*

Two self-developed instruments were used for data collection. The Bandura (2006) guidelines for constructing efficacy scale were taken into consideration for the construction of the scales. These include domain specification, gradation of challenge, construct relevance, response scaling, phrasing of items, item analysis, minimizing response bias and validation.

The first instrument was the Perceived Coaching Intervention Questionnaire (PCIQ) which is a 16-item statement of four point rating Likert format of Strongly Agree(4points), Agree (3points), Disagree (2points) to Strongly Disagree (1 point). It has four sub-scales with a scale wise internal consistency values for Positive feedback ( $r=.71$ ); Encouragement ( $r=.81$ ); Technical Information ( $r=.73$ ) and Negative feedback ( $r=.76$ ). The overall reliability coefficient for the scale was ( $r=.84$ ). A total perceived coaching intervention score is calculated by summing the 16 rated items. Some of the items are "the recognition I received from my coach(es) as a result of my beautiful performance motivates me to work hard for the success of the team", I see my coach(es) as very effective because of the word of encouragement to move on". "An effective coach give the appropriate technical advice to improve on

one's skill", "the criticisms from my coach(es) following mistakes assisted me to do things right during game situations".

The second instrument was the Effective Coaching Scale (ECS) which was an 8-item statements, self-develop scale in a four Likert format of Strongly Agree (4- points), Agree (3- points), Disagree (2- points) to Strongly Disagree (1- point). A total perceived coaching effectiveness score was calculated by summing the 8 rated items. Internal consistency reliability coefficient of the scale was ( $r = .79$ ). Examples of items in the scale are "An effective coach give comments that can make athletes to be successful", My coach is very effective because of the constructive criticisms that he makes based on my performances during training and game situations". In order to reduce the items of both scales to a meaningful size, a principal component factor analysis with varimax rotation was conducted for the sample. Criteria for item retention on a factor were set at .05. The two instruments were reliable because it met the Nunnally (1998) Criterion of ( $r = .70$ ), expected of psychometric measures.

### Design and Data Analysis

The descriptive survey design of correlation was used because the variables involved in this study were not manipulated. While descriptive statistics of percentage and mean were used were appropriate. The parametric statistics of correlation and the multiple regression models were also used for the relationship and prediction.

### Results

The results from table 1 below showed there were positive correlations between Effective Coaching and Encouragement ( $r = .514$ ,  $P < .05$ ), Technical Information ( $r = .614$ ,  $P < .05$ ), Negative Feedback ( $r = .591$ ,  $P < .05$ ), Positive feedback ( $r = .585$ ,  $P < .05$ ).

Table 1: Correlation Matrix Showing the Relationships between Independent Variables (Positive feedback, Encouragement, Technical Information and Negative Feedback) and Effective Coaching

	Effective Coaching	Recognition	Encouragement	Technical Information	Negative Feedback	Mean	Std. Dev.
Effective Coaching	1					26.83	3.32
Positive feedback	.585**	1				31.50	3.78
Encouragement	.514**	.426**	1			13.51	1.78
Technical Information	.614**	.127	.587**	1		13.62	1.59
Negative Feedback	.591 **	.174	.448**	.644**	1	13.46	1.54

\*\* Sig.  $p < .01$  level, \* Sig.  $p < .05$  level

Table 2: The Joint Contribution of the Independent Variables Independent variables (Positive feedback, Encouragement, Technical Information and Negative Feedback) on Effective Coaching

R	R Square	Adjusted R Square	Std. Error of the Estimate			
.685	.469	.442	2.4732			
ANOVA						
Model	Sum of Squares.	DF	Mean Square	F	Sig.	Remark
Regression	426.439	4	106.610	17.429	.000	Sig.
Residual	483.228	79	6.117			
Total	909.667	83				

Table 2 showed the joint contribution of the four independent variables to the prediction of the dependent variable i.e. Effective Coaching correlated positively with the four predictor variables. The table also showed a coefficient of multiple correlation (R =.685 and a multiple R<sup>2</sup> of .469. This means that 46.9% of the variance in the dependent variables was accounted for by four predictor variables when taken together. The significance of the composite contribution was tested at p < .05. The table also showed that the analysis of variance for the regression yielded a F-ratio of 17.429 (significant at 0.05 level). This implies that the joint contribution of the independent variables to the dependent variable was significant and that other variables not included in this model may accounted for the remaining variance.

Table 3. The Relative Contribution of the Independent Variables (Positive feedback, Encouragement, Technical Information and Negative Feedback) on Effective Coaching

Model	Unstandardized Coefficient	Std. Error	Standardized Coefficient	t	Sig.
(Constant)	4.374	3.148		1.390	.169
Positive feedback	7.326E-03	.077	.409	4.095	.000
Encouragement	.365	.210	.327	2.744	.001
Technical Information	.635	.259	.297	2.454	.016
Negative Feedback	.650	.227	.310	2.867	.005

Table 3 showed the various relative contributions and levels of significance of the independent variables: Recognition (β = .409, p <.05), Encouragement (β = .327, p <.05), Technical Information (β = .297, p <.05) and Negative Feedback (β = .310, p <.05). Table 4 indicated mean rating of coaching intervention indices by athletes.

Table 4. Mean Rating of Coaching Intervention Indices by Athletes

Intervention Indices	Mean	S.D	Ranking
Positive Feedback	31.50	3.78	1
Encouragement	13.51	1.78	3
Technical Information	13.62	1.59	2
Negative feedback	13.46	1.54	4

## Discussion

Literature review on coaching interventions demonstrates the importance of coaching relationships and provided practical examples of how effective coaching could be established, ranging from individual requirements to organizational needs. Establishing effective coaching relationship requires an in-depth examination of the needs of athletes from the psychosocial perspectives as well as the feelings or rating of these coaches by the same athletes.

The findings in this study showed that the four identified perceived behavioral coaching intervention related to the athletes' perception of coaching effectiveness. Smith and Smoll (1990) were of the opinion that athletes responded favorably to coaches who emphasized encouragement and technical assistance but not to coaches who were punitive or frequently made negative comments or gave correction in a hostile manner.

Findings showed positive relationship of encouragement and technical information with effective coaching lend credence to Smith and Smoll (1990) submissions. An earlier research of Smith, Zane, Small and Coppel (1983) similarly agreed with the findings of this study. That studied found out that young basketball players responded favorably to positive feedback, encouragement, technical instruction and criticism of their coaches. Athletes on high school female and male basketball teams were more satisfied with the effective. Coaching leadership atmosphere of their teams when coaches were more supportive and gave more frequent positive feedback and less frequent negative feedback (Fisher, Mancini, Hirsch, Proux and Starrowsky, 1982).

Findings of this study also showed that the perceived coaching intervention indices could be used to positively predict coaches' effectiveness. This invariably means that if these coaches were provided with training, using for example the coaching effectiveness training (CET; Smith, Smoll and Curtis, 1979), this could continually gave more encouragement, more technical support, more positive feedback, fewer punitive responses and less negative feedbacks to athletes. The athletes in their rating found positive feedback as the best of the intervention provided by the coaches. An effective coach who always provided positive feedbacks to athletes will always be successful, especially when these feedbacks serves as a form of reinforcement for skilled action on the part of the athletes.

Coaches were extremely interested in knowing about methods that could be used to help athletes build, maintain and regain confidence. Findings also understand that coaches' own confidence in their ability to coach was important and could have powerful effect on their athletes. (Feltz, Short, and Sullivan, 2008). In addition, to examining observable behaviours, Doug and Hastie (1993) indicated that



effective coaches also observe, analyze, and synthesize information and modify those coaching to fit the situation and the need of the athletes involved. Several studies have identified further effective behaviours of expert coaches including: planning, creating a positive training environment, teaching effectively, 'envisioned' excellence, individualization, establishing positive coach-athlete relationships (Cote & Sedgwick, 2003; Cross, 1995; Dowdell, 2010).

Cote and Gilbert (2009) provide a conceptualization of coaching effectiveness and effective coaching with a link to coaches' expertise. First defined coaching effectiveness as "the consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts". In light of this definition of coaching effectiveness, Cote and Gilbert suggested that expertise was about a specific knowledge base coaches acquire. This expertise in the opinion of the authors of this paper determined the type of intervention index or indices that the coaches should give at a given period. Professional knowledge refers to the 'how to' element of effective coaching. This was the content and the delivery elements of coaching. Interpersonal knowledge refers to coaches' social interactions, and the coaches-athletes relationship. Intrapersonal knowledge reflected coaches' ability for introspection and reflection, and continued pursuit of improvement.

Furthermore, an effective coach demonstrated the ability to apply these interventions in research's work with athletes such that learning outcomes are achieved. Where these outcomes were athletes' competence, confidence, connection and character, the coach would be considered to be effective. Finally, when a coach demonstrated this effectiveness over an extended period of duration may be considered expert coaches. Strength of Cote and Gilbert's approach is that they recognize the importance of the coaching context in determining an effective coach. Performance demands and athlete developmental level are considered the two most important elements of the coaching context. Effectiveness is applying knowledge in ways that were appropriate to the demands and developmental level of the athletes in a particular coaching domain. The conceptually grounded definition presents a promising direction for research in the domain of effective coaching in sport.

## Conclusion

This study identified some basic intervention indices which the athletes perceived to demonstrate effective coaching practice. Through this work, the athletes demonstrated that positive feedbacks, encouragement, technical information and negative feedbacks which come in form of constructive criticisms positively influence effective coaching. It was noteworthy to state that many of the features of excellent coaching practice were found in these coaching intervention variables. This study also identified that positive feedback was the most potent of the four interventions as perceived by the athletes. The recognition of these excellent intervention coaching practice along the various sporting pathway may support developments in models and frameworks for sport in Nigeria and globally.

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## **CONSTRUCTION OF CARDIOVASCULAR ENDURANCE TEST NORMS FOR PHYSICAL FITNESS TEACHER CANDIDATES IN MALAYSIA**

Aris Fazil Ujang., & Ch'ng Swee Ghiam  
*Institut Pendidikan Guru Kampus Ilmu Khas, Kuala Lumpur, Malaysia.*

Shamsul Bahri Ismail  
*Institut Pendidikan Guru Kampus Bahasa Melayu, Kuala Lumpur, Malaysia.*

Zarizi Ab Rahman  
*Faculty of Education, Universiti Teknologi MARA, Selangor, Malaysia.*

Liza Saad  
*Institut Pendidikan Guru Kampus Perlis, Perlis, Malaysia*

Malathi Balakrishnan  
*Institut Pendidikan Guru Kampus Bahasa Antarabangsa, Kuala Lumpur, Malaysia*

Wan Yusof Wan Ngah., & Muhamad Nazib Hashim  
*Institut Pendidikan Guru Malaysia, Cyberjaya, Malaysia*

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*Correspondents Author,*

**Aris Fazil Ujang**  
[aris@ipgkik.edu.my](mailto:aris@ipgkik.edu.my)  
**Institut Pendidikan Guru Kampus Ilmu Khas,  
Kuala Lumpur, Malaysia**

## Construction of Cardiovascular Endurance Test Norms for Physical Fitness Teacher Candidates in Malaysia

Aris Fazil Ujang<sup>1</sup>., Ch'ng Swee Ghiam<sup>1</sup>., Shamsul Bahri Ismail<sup>2</sup>., Zarizi Ab Rahman<sup>3</sup>., Liza Saad<sup>4</sup>., Malathi Balakrishnan<sup>5</sup>., Wan Yusof Wan Ngah<sup>6</sup>., & Muhamad Nazib Hashim<sup>6</sup>

<sup>1</sup>Institut Pendidikan Guru Kampus Ilmu Khas, Kuala Lumpur, Malaysia

<sup>2</sup>Institut Pendidikan Guru Kampus Bahasa Melayu, Kuala Lumpur, Malaysia

<sup>3</sup>Faculty of Education, Universiti Teknologi MARA, Selangor, Malaysia

<sup>4</sup>Institut Pendidikan Guru Kampus Perlis, Perlis, Malaysia.

<sup>5</sup>Institut Pendidikan Guru Kampus Bahasa Antarabangsa, Kuala Lumpur, Malaysia

<sup>6</sup>Institut Pendidikan Guru Malaysia, Cyberjaya, Malaysia

### Abstract

*The aim of this study was to construct the norms of cardiovascular endurance test. The subjects involved in this study were 14531 subjects (male = 4323; female = 10208) consisting of candidates who participated in the Prospective Teachers Eligibility Test (PTET) during 2016 and 2017. The Multistage 20-meter Shuttle Run was used to test the cardiovascular endurance of each subject. The findings used mean and standard deviation to establish norms for VO<sub>2</sub>max. VO<sub>2</sub>max norms for each age and gender had been established and were classified into five stages; namely superior, excellent, good, average and poor. The norms formed were suitable as a norms-referenced for cardiovascular endurance component of the Physical Fitness Test in the selection of teacher candidates in Malaysia.*

*Key words: Prospective Teachers Eligibility Test, Multistage 20-meter shuttle run, maximal oxygen uptake, Norms*

### Introduction

In line with the National Education Philosophy (NEP), which aims to produce a balanced and harmonious human intellectually, spiritually, emotionally and physically, the Institute of Teacher Education (ITE) had implemented Physical Fitness Tests (PFT) for prospective Bachelor of Teacher Education. This test was intended to identify the fitness level of prospective teachers of their physical fitness. Physical fitness will be the criteria to produce graduate teachers who are always healthy, cheerful, disciplined, honourable, and competent and visionary in line with the level of skills and knowledge (Institut Pendidikan Guru Malaysia, 2017a). One of the components of physical fitness is cardiovascular endurance.

Cardiovascular endurance is one of physical fitness health related components that can be defined as the ability of the circulatory system, respiratory and muscular systems to supply oxygen during regular physical activity (Lee, Artero, Sui, & Blair, 2010) which were associated with maximal oxygen uptake (VO<sub>2</sub>max). VO<sub>2</sub>max refers to the intensity of an aerobic process and shows the maximum

capacity to transport and use oxygen during exercise of increasing intensity.  $VO_{2max}$  is the highest rate of oxygen consumption during exercise achieved the maximum (Rancovic, Mutavdzic, Taskic, Preljevic, Kocic, & Rancovic, 2010). According to (American College of Sports Medicine, 1999), reported that  $VO_{2max}$  is the best indicator to determine cardiovascular fitness. As a measure of aerobic capacity,  $VO_{2max}$  is determined as an international standard physical activity (Fleg, Piila, & Balady, 2000).

Therefore, this study aimed to construct cardiovascular endurance norms for candidates who took the Physical Fitness Test in the Prospective Teachers Eligibility Test for Teacher Education Institute. This study was carried out to produce norms for the population aged between 17 and 36 years who took the Physical Fitness Test (PFT) in the Prospective Teachers Eligibility Test (PTET). The norms were supposed to have validity, reliability and objectivity. Valid and reliable norms to indicate the level of achievement of a factor that had been shown by the subjects that were tested. The norms constructed using related subjects would be more valid and reliable than the norm constructed using different research subjects with demographic characteristics such as lifestyle, socio-cultural and socio-economic status.

The data obtained can be used to build fitness test norms for cardiovascular endurance component. Moreover, it had helped the Institute of Teacher Education (ITE) in determining eligibility limit that can be certified for selecting prospective teachers. The norms build was also expected to serve as a guide in testing, measurement and evaluation of physical fitness of students IPG with the creation of student's profiles based on the Prospective Teachers Eligibility Test (PTET) in Cluster 6: Improvement students that target retention quality of students by teachers' personality, mental health and the fitness of the students during the period of study at the institute (Institut Pendidikan Guru Malaysia, 2017a).

## Methodology

This study involved a total of 14,531 subjects aged between 17 to 36 years. The subjects were divided into three age groups of 17 to 20 years, 21 to 28 years and 29 to 36 years. The subjects were prospective teachers who undergo competency tests for admission to the Institute of Teacher Education in Malaysia for 2016 and 2017. The letter of consent and permission from the parents or guardians, and also the declaration of health status were received before the test was conducted.

All subjects went through Multistage 20-meter Shuttle Run according to the test procedures by Leger and Lambert (1982) to assess the level of cardiovascular endurance. Hamlin, et al. (2014), reported that the validity is associated with the test for children and adolescents with acceptable validity coefficient was  $r = 0.73$ . While the reliability was  $r = 0.99$  (Pilianidis, et al. 2008). Testers at the test centres were appointed amongst physical education lecturers. All testers were given briefings and training for testing and measurement procedures. Those involved also provided with the Physical Fitness Testing Guidelines (Institut Pendidikan Guru Malaysia, 2017b) from the Institute of Teachers Education Malaysia (ITEM). This guideline contained instructions and procedures for the implementation of this test to ensure consistency in administering the test. All tests were conducted in the same week that had been set by ITEM.

$VO_{2max}$  was estimated using the method by Leger, Mercier, Gadoury and Lambert (1988), expressed in per unit of body mass ( $ml.kg^{-1}.min^{-1}$ ). The establishment of norms for  $VO_{2max}$  were created using standard deviation method by Miller (2014)(Table1). Data analysis was carried out using descriptive and inferential clues mean, standard deviation,  $t$ -test and ANOVA. To ensure that the data set is normally distributed, normality test was assessed using the distribution skewness and kurtosis, and normality revisions graphically based on probability plot (Normal Q-Q plot) (Pallant, 2011). All

analyses are managed using the software Statistical Package for the Social Sciences (SPSS) version 22.0.

*Table 1: Norms Assigned by Standard Deviation Method*

<b>Standard Deviation Range</b>
min + 1.5(sd) above
min + 0.5(sd) to min + 1.5(sd)
min – 0.5(sd) to min + 0.5(sd)
min – 1.5(sd) to min – 0.5(sd)
min – 1.5(sd) below

#### *Multistage 20 Meter Shuttle Run Procedures*

The subjects will stand behind the starting line and start running after a first 'bleep' sound. Subjects must cross the line ahead before the next 'bleep' sound. If the subject comes before the 'bleep' sound, the subject must wait until the next 'bleep' sound to continue the run. Scores will be calculated on the 'level' and 'shuttle' last achieved.

## **Results and Discussion**

This study involved a total of 4323 male and 10208 female subjects. (Mean and standard deviation - Male: age = 21.9, sd = 4.5; height = 1.67m, sd = 0.1; weight = 63.4kg, sd = 11.8; Female: age = 19.75, sd = 3.6; height = 1.55m, sd = 0.1; weight = 53.8kg, sd = 11.4). For male and female, subjects were divided into three age groups as shown in Figure 1. The mean for each age category; 17 to 20 years (mean age: male = 18:22; female = 18:22), 21 to 28 years (mean age: male = 25.76; female = 25.56) and 29 to 36 years (mean age: male = 30.67; female = 30.73).

Exploratory data analysis was carried out to check the data from error before data analysis was performed. The analysis also showed that there were few cases of isolated data and the detected cases eliminated. Inter-examiner reliability of several test centre was between the range of acceptable reliability with a correlation coefficient between 0.82 to 0.87 (Baumgartner, Jackson, Mahar & Rowe, 2003).

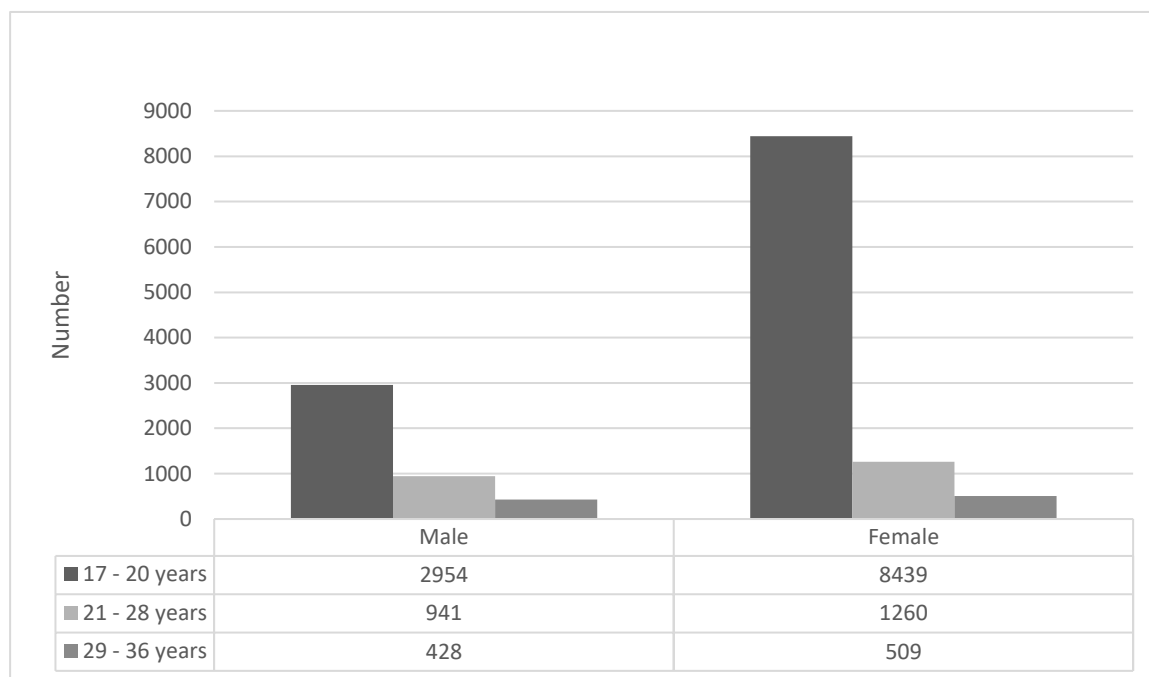


Figure 1: Age Category and Number of Male and Female Subjects

Independent t -test was conducted to compare  $VO_2max$  scores between male and female. The analysis showed that there was a significant difference [ $t(5237.57) = 100.85, p = 0.000$ ] between male (mean = 51.85; sd = 4.2) and female (min = 45.00; sd = 2.1). Based on the results, formation of norms for male and female were separated. One-way ANOVA was conducted to compare  $VO_2max$  scores among the three age categories. The analysis showed significant differences [ $F(2.4320) = 265,894, p = 0.000$ ] between the age categories for male at 0.05 significant level. For female, also showed significant differences [ $F(2.10205) = 169,943, p = 0.000$ ] between the age categories at 0.05 significant level. Therefore, all analyses for the establishment of norms for  $VO_2max$  conducted separately by age categories for male and female.

Table 2 showed the mean and standard deviation for  $VO_2max$  scores of male and female subjects for each age category. Based on the analysis, it was found that the mean score of male subjects was higher than female for each age category. To test normality, referring to Table 3, the analysis showed coefficients of skewness and kurtosis were between -2 and +2 (George & Mallery, 2010) which showed that the data were normally distributed.

Table 2: Descriptive Analysis and Normality Tests of  $VO_2max$  Score Based on Gender and Age Category

Category / Age	Min	sd	Skewness	Kurtosis
<u>Male</u>				
17 – 20	52.78	4.4	-.045	-.521
21 – 28	50.28	2.9	.114	-.937
29 – 36	48.90	3.3	.079	-.320
<u>Female</u>				
17 – 20	46.00	2.1	.225	-.594
21 – 28	45.75	2.2	.255	-.200
29 – 36	44.00	2.1	.522	.383

Referring to Figure 2, a review of normal Q-Q plot showed that the distribution of data for each age groups and gender focused on the straight line which also showed that the data were normally distributed.

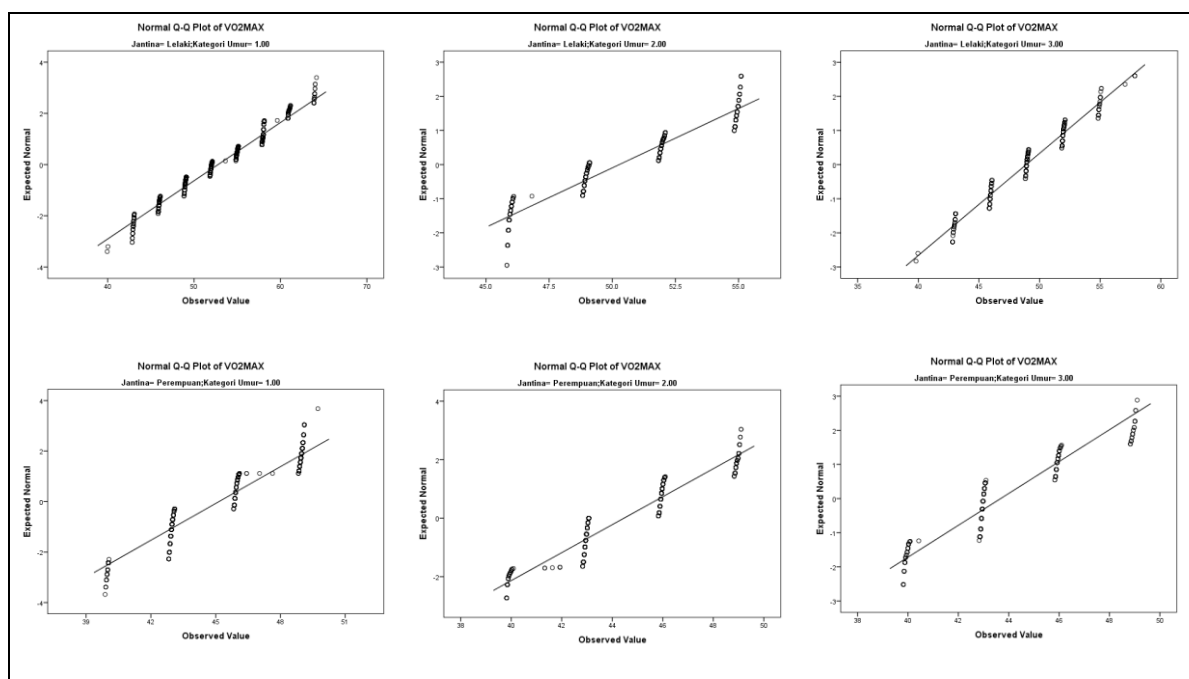


Figure 2: Analysis of normal Q-Q plot of VO<sub>2</sub>max scores by age category and gender.

Based on the mean and standard deviation, VO<sub>2</sub>max norms for each age groups for male and female has been set up as shown in Table 3 and can form a normal distribution (Figure 3).

Table 3: VO<sub>2</sub>max Norms Based on Gender and Age Category

Gender	Performance	Age Category (Years)		
		17 – 20	21 – 28	29 – 36
Male	Superior	59.39 & above	54.64 & above	53.86 & above
	Excellence	54.99 – 59.38	51.74 – 54.63	50.56 – 53.85
	Good	50.58 – 54.98	48.83 – 51.73	47.25 – 50.55
	Average	46.18 – 50.57	45.93 – 48.82	43.95 – 47.24
	Poor	46.17 & below	45.92 & below	43.94 & below
Female	Superior	49.16 & above	49.06 & above	47.16 & above
	Excellence	47.06 – 49.15	46.86 – 49.05	45.06 – 47.15
	Good	44.95 – 47.05	44.65 – 46.85	42.95 – 45.05
	Average	42.85 – 44.94	42.45 – 44.64	40.85 – 42.94
	Poor	42.84 & below	42.44 & below	40.84 & below



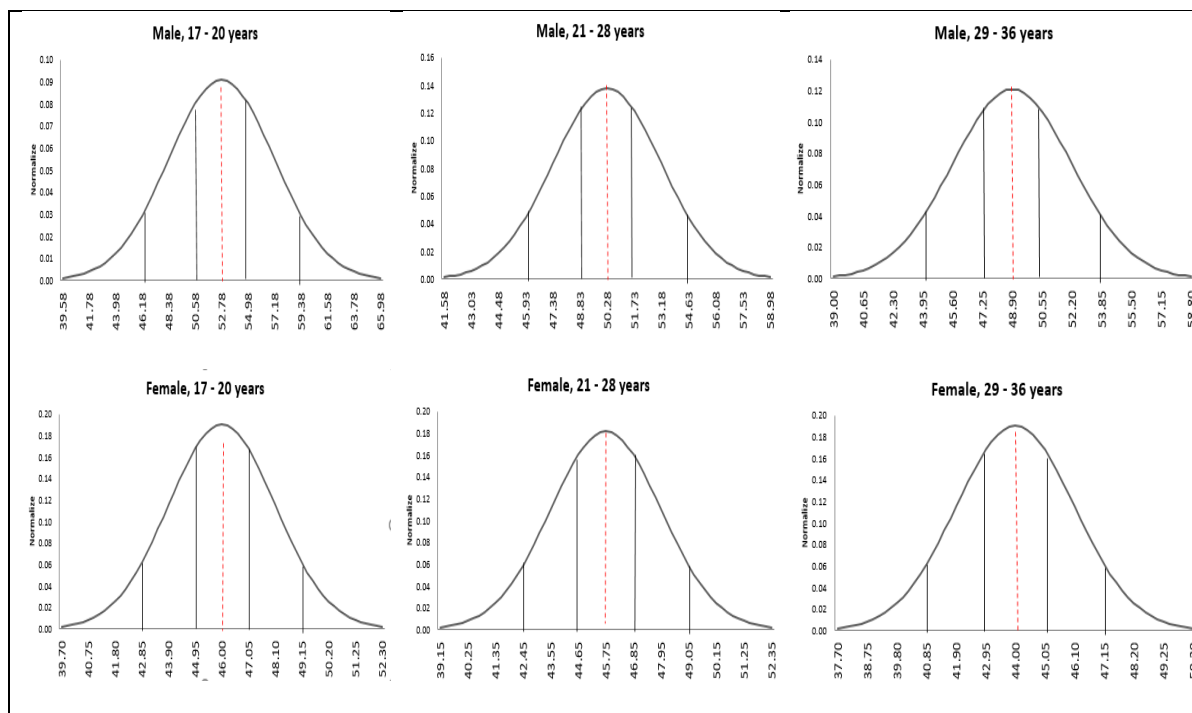


Figure 3: Normal Distribution Based on VO<sub>2</sub>max Norms for Each Age Category for Male and Female

### Conclusion

The construction of norm-referenced achievement based on health - related physical fitness for cardiovascular fitness was analysed using descriptive statistical (mean and standard deviation) (Miller, 2014). The analysis of achievements was classified into five stages, namely Superior, Excellent, Good, Fair and Poor. Norms was formed from the raw scores of the population aged between 17 and 35 years old. The norms formed can and be modified for use as norm-referenced for Physical Fitness Test in Malaysia Teacher Eligibility Test Candidates for determining the level of cardiovascular in Malaysia.

### Appreciation

The Heads of Department and lecturers from the Department of Physical Education or the parties involved directly or indirectly in the execution of tests and data collection during PTET.

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## **THE FREQUENCY OF BREAKFAST CONSUMPTION BETWEEN MALES AND FEMALES AMONG SPORTS SCIENCE UNDERGRADUATES**

Mohamad Hisyam Izzuddin Bin Mohamed Ishak

Razali Bin Mohammed Salleh

*Faculty of Sports Science and Recreation,  
Universiti Teknologi MARA Shah Alam, Selangor*

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**Correspondents Author,**

**Mohamad Hisyam Izzuddin Mohamed Ishak**

[mohamadhisyamizzuddin@gmail.com](mailto:mohamadhisyamizzuddin@gmail.com)

**Faculty of Sport Science and Recreation,**

**Universiti Teknologi MARA Shah Alam**

**Selangor.**

## The Frequency of Breakfast Consumption between Males and Females among Sports Science Undergraduates

Mohamad Hisyam Izzuddin Bin Mohamed Ishak., & Razali Bin Mohammed Salleh

*Faculty of Sports Science and Recreation,  
Universiti Teknologi MARA, Shah Alam, Selangor.*

### Abstract

*Human health depends on regular practice of healthy lifestyles which included a balanced diet that consist of a variety of important nutrients in the food. Creating a balanced diet and regular eating habits were the basis of the positive changes in our eating habits and it was also as the source of our recovery. Breakfast had been the most important meal of the day. However, there were still evidences of individuals who skip breakfast. The purpose of this study was to determine the frequency of breakfast consumption between male and female among sports science undergraduates. A total of 50 undergraduates participated in this study. Result of the study showed 66% of sports science undergraduates took breakfast while 34% of them were classified as breakfast skippers. Male were frequently taking breakfast (72%) as compared to female students (60%) ( $p < .05$ ). In conclusion, sports science study promotes awareness on healthy lifestyle apart from sports and breakfast was one of the factors. Extra work to spread the health awareness to the people could be significant for illuminating a better lifestyle.*

*Keywords: Breakfast, physical activity, time management, university students.*

### Introduction

Human health depends on a balanced diet including a variety of important nutrients in the food (Brittain, Kremen, Garber, & Klein, 2014). Creating a balanced diet and regular eating was the basis of the positive changes in our eating habits and it was also the basis of our recovery. Unhealthy eating habit increased the inherent risk of metabolic disorder and disease which most common of all was obesity (Nurul-Fadhilah, Teo, Huybrechts, & Foo, 2013).

Breakfast was the most important meal of the day (Arora, Nazar, Gupta, Perry, Reddy, & Stigler, 2012; Dwyer, 2014; Rampersaud, Pereira, Girard, Adams, & Metz, 2005). Breakfast was defined as the first meal of the day to break the fast after a long sleep and taken within 2 to 3 hours after waking. Breakfast consisted of a food or beverage from one of the food groups, and can be eaten at any locations (O'neil, Byrd-Bredbenner, Hayes, Jana, Klinger, & Stephenson-Martin, 2014). Eating breakfast had many benefits and had been proven in previous studies. The benefit was related to cognitive performance (Hoyland, Dye, & Lawton, 2009; Widenhorn-Müller, Hille, Klenk, & Weiland, 2008) and a healthy lifestyle (Widenhorn-Müller et al., 2008). The benefits of healthy lifestyles were associated with nutrient intake, nutritional quality and weight management (Dubois, Girard, Kent, Farmer, & Tatone-Tokuda, 2009).

However, breakfast skipping was defined as an individual who skip breakfast for 3 or more days per week (Deshmukh-Taskar, Nicklas, Radcliffe, O'neil, & Liu, 2012; Nicklas, Reger, Myers, & O'neil, 2000).

Thus, there was an evidence showing people tend to skip breakfast due to certain factors (Moy, Johari, Ismail, Mahad, Tie, & Wan Ismail, 2009). Some of the factors were age, race, accommodation, student's life, type of food choice, sociodemographic and skipping dinner (Dubois et al., 2009; Moy et al., 2009).

Poor dietary habits were a public health problem, especially among young adults who were experiencing the transition to university life (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). Adults were susceptible to pressure and often a lack of time (Sajwani, Shoukat, Raza, Shiekh, Rashid, Siddique et al., 2009). These factors pose barriers to a healthy life, such as unhealthy eating habits and drug abuse (Nelson et al., 2008). Although undergraduates' behavior will not remain permanent, but there was a tendency that undergraduates still carry on the same negative habits for the most part consistent in the lives of more older adults (Silliman, Rodas-Fortier, & Neyman, 2004). So, the pressure in the university life and the burden of works and assignment becomes one of the negative factors that affect their diet and unhealthy lifestyle (Mikolajczyk, El Ansari, & Maxwell, 2009).

Taking breakfast was considered very important meal to supply us with sufficient energy to kick start our day. Previous statistic showed about 24.6% of children skipped breakfast at least 3 days per week. Besides, more girls (26.4%) skipped breakfast when compared with boys (22.05%) (Keski-Rahkonen, Kaprio, Rissanen, Virkkunen, & Rose, 2003). Considering the differences in male and female on different age group would be a valuable finding investigating the frequency of taking breakfast. This data showed us that the issues of breakfast skipping was not a matter that should be taken for granted. Since university undergraduates were the representative to the promotion of healthy eating lifestyles among a large young adult population, then it was suitable to bring the population into spotlight for this study (Sakamaki, Toyama, Amamoto, Liu, & Shinfuku, 2005). Plus, there were only few studies on university undergraduates which focusing on factors related to time management among university.

Therefore, the purpose of this study was to determine the frequency of breakfast consumption between male and female among Sports Science undergraduates.

## **Method**

This study used a cross-sectional design. This was due to determine the relationship between two or more variables of the groups through questionnaires. A total of 50 full time undergraduates from Bachelor of Sports Science courses were the respondents of this study. The sample size was computed using the G-Power (version 3.1) software. This software was used due to the convincing method because of its output that uses not only by type of statistical analysis, but also with graphs (Faul, Erdfelder, Buchner, & Lang, 2009).

A 14-items of Student Breakfast Attitude Questionnaire was used for this study. This questionnaire was adopted from Ohio Department of Education and Tapper, Murphy, Lynch, Clark, Moore, and Moore (2008) study. This questionnaire was designed to determine the frequency of breakfast habits among students. This question had five response options, "never", "1-2 times in a week", "3-4 times in a week", "5-6 times in a week" and "every day".

The 14-item scale showed moderate to high levels of constructed validity, internal reliability and test-retest reliability (0.38, 0.85 and 0.66) respectively. Preliminary analysis also suggested good external validity. It was therefore deemed suitable for use in the evaluation.

In this study, the descriptive analysis used was mean, standard deviation and frequency. It was used to describe the demographic data of participants and the variables. For inferential analysis, Independent t-test was used to compare between genders.

## Result

### *Physical Characteristic Profile of The Respondents*

Table 1 showed the demographic characteristics of the respondents for this study. A total of 50 respondents (male = 25, female = 25) who answered and completed the questionnaire in this study.

*Table 1: Physical Characteristic of the Respondents*

Characteristics	Minimum	Maximum	Mean	Std. Deviation
Age (Years)	20	25	22.94	2.53
Height (cm)	145.00	180.00	163.22	7.52
Weight (kg)	38.10	100.00	60.26	14.37
Semester	3	5	4.00	0.76
Year of Sport Involvement	1.00	13.00	8.54	5.00

Note: n = 50

The mean age of the respondents was (mean = 22.94, SD = 2.53) years old. The oldest respondent in this study was 25 and the youngest was 20. The mean weight of the respondents was (mean = 60.26, SD = 14.37) and the mean height was (mean = 163.22, SD = 7.52). The mean year of sport involvement was (mean = 8.54, SD = 5.00) years. All the respondents in this study were taken from semester three to semester five.

### *Breakfast Consumptions Among Respondents*

Table 5 showed the frequency table which aim to determine the breakfast consumption between Sports Science undergraduates. The result showed that the undergraduates who consumed breakfast (f = 33) was higher than the breakfast skipper (f = 17).

*Table 2: Breakfast Consumption among Respondents*

Sex	Breakfast Consumption	Frequency	Percent
Male	Breakfast eater (BE)	18	72.0
	Breakfast skipper (BS)	7	28.0
Female	Breakfast eater (BE)	15	60.0
	Breakfast skipper (BS)	10	40.0
Total	Breakfast eater (BE)	33	66.0
	Breakfast skipper (BS)	17	34.0

### *Differences of Breakfast Habits by Sex*

An independent t-test was carrying out to determine any groups related differences on the breakfast habits between gender As presented on Table 6, there was a significant different in breakfast habits between gender,  $t(48) = 2.616, p = .012$ . Based on Table 5, breakfast eater was higher in male (75%) as compared to female (60%).

Table 1: Independent t-test Result

	Gender			95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Lower	Upper
Breakfast Habits	2.616	48	.012	.750	5.730

## Discussion

In this study, the frequency of breakfast eater among Sports Science undergraduates were higher compared to breakfast skipper. This survey showed 66% of Sports Science undergraduates took breakfast while 34% of them were classified as breakfast skippers. This showed a good feedback that the undergraduates do practice a good breakfast habits. Besides, this could also be related to physical daily learning schedule among Sports Science undergraduates need more energy to cope with fatigue after training and competitions. The present study showed similarities with previous study (Sakamaki et al., 2005).

Sports Science was the study of how the healthy human body works during exercise, and how sport and physical activity promote health, physically, mentally and socially. The study of Sport Science incorporated many other academic studies and areas, like physiology, psychology, anatomy, and nutrition. So, these respondents understood the important of taking breakfast as healthy lifestyles.

The result from table 2 showed a significant different in breakfast habits between gender,  $t(48) = 2.616, p = .012$ . The result from the frequency of breakfast consumption shown a difference percentage between breakfast eater and skipper which more undergraduates were breakfast eater than skipper. This align with the result to determine the different on breakfast habits between gender. When comparing the percentage of breakfast eater between gender, about 72% were males and 60% were females. It showed that more males undergraduates eating breakfast in the morning and had a better breakfast habits compared to female undergraduates. Additionally, respondents were not provided with a definition of breakfast; hence, male and female respondents may have had different opinions of what constitutes breakfast, and different factors may influence this association in males and females. Perhaps breakfast skipping was high in females may be related to unhealthy behaviors (Keski-Rahkonen et al., 2003). It was also possible that mood difficulties or depression could play a role, as appetite loss and lethargy were both associated with depression (Poli, Sbrana, Marcheschi, & Masi, 2003).

However, this study was contradicted with the study of Moy et al. (2009) that percentage of breakfast skipper were higher in males. The differences were due to the different in the field of study in the university that the student was studying. Despite that, there was still study which supported that males eat breakfast more frequently than females (Siega-Riz, Popkin, & Carson, 1998). The reason was that female individuals seem to be more concerned about their body shape and fitness and were therefore more prone to go on self-administered weight-loss diets. At their age, these students often think a lot about how their bodies look and compared their bodies with others. A positive body image is an important part of healthy self-esteem and feel positively about their body.

Another factor of male having better breakfast habits was the involvement in sports. The respondents of this study were from Sports Science undergraduates and their basic requirement to enroll into the course was that the student must involve in sports and were tested in their physical fitness.

In this study, male undergraduates were involved in sports competitively with mix level from university level to National level's player. These undergraduates played for organized competitive sport sponsored by the educational institution. The sports demand required strength, skill, and endurance to perform well in game. Thus, physical health was key to an active lifestyle and need special care to get enough of the calories, vitamins, and other nutrients that provided energy. The concern on undergraduates' dietary intake to supply the demand of the body makes these students take breakfast regularly. Perhaps the respondents in this study were also practicing a good dietary intake daily but no data was sufficient to support the statement.

## Conclusion

As a conclusion, the undergraduates' intake on breakfast seems to be on a positive side. The significance of training elevating general breakfast eating to youngsters, teenagers, university students and grown-ups have been expressed as imperative focuses for solid ways of life. The present findings add weight to the arguments that university undergraduates ought to be the medium that shape these healthy lifestyle advancement procedures which may warrant assist further investigation and may demonstrate important variables aiming to increase lifestyle.

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## **THE EFFECT OF COLD -WATER IMMERSION AND PASSIVE REST ON RECOVERY AMONG SPRINT ATHLETES**

*Maisarah Binti Mohd Saleh*

*Nurul Nadiah Binti Shahudin*

*Fatin Aqilah Binti Abd Razak*

*Siti Fadhilah Binti Abdul Hamid*

*Muhammad Na'imullah bin Zakaria*

*Faculty of Sport Science and Recreation, Universiti Teknologi MARA Cawangan Pahang,  
Kampus Jengka, Pahang, Malaysia.*

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### **Correspondents Author,**

**Maisarah Bt Mohd Saleh**

[sarahms@uitm.edu.my](mailto:sarahms@uitm.edu.my)

**Faculty of Sports Science and Recreation,  
Universiti Teknologi MARA Cawangan Pahang,  
Kampus Jengka,  
26400 Bandar Tun Abdul Razak Jengka Pahang,  
Malaysia.**

## **The Effect of Cold -Water Immersion and Passive Rest on Recovery among Sprint Athletes**

Maisarah Binti Mohd Saleh

Nurul Nadiyah Binti Shahudin

Fatin Aqilah Binti Abd Razak

Siti Fadhilah Binti Abdul Hamid

Muhammad Na'imullah bin Zakaria

*Faculty of Sport Science and Recreation, Universiti Teknologi MARA Cawangan Pahang,  
Kampus Jengka, Pahang, Malaysia.*

### **Abstract**

*Recovery technique could help lessen the fatigue, increased the level of athletes' fitness and performance. The main purpose of this research was to study the effect of cold - water immersion and passive rest on recovery of performance among sprint athletes. 14 young athletes were selected and have been divided into two groups that was cold- water immersion group (n = 7) and passive rest group (n = 7). Subjects performed three tests; (i) 35meter sprint, (ii) standing broad jump and (iii) sit and reach. Before the athletes did the test, they warm up themselves for 10 minutes. After that, subjects did the recovery techniques which was for 15 minutes and then repeated the tests. Data analysis was analysed using paired samples test which was pre-test and post-test. The results showed that there was significant effect of cold - water immersion on performance, there was significant effect of passive rest on performance and there were significant different on cold - water immersion and passive rest on performance. Cold - water immersion result for 35 meter sprint ( $p = 0.001$ ), standing broad jump ( $p = 0.030$ ) and sit and reach ( $p = 0.002$ ) which was showed the decreased of performance and then for passive rest the result in 35 meter sprint ( $p = 0.040$ ), standing broad jump ( $p = 0.042$ ) and sit and reach ( $p = 0.000$ ) which showed the improvement through cold – water immersion. Implication of this study found that passive rest was good recovery technique for short period of time and cold - water immersion was good for longer period of time.*

*Keywords Cold water immersion, passive rest, skill related fitness, sprinter,*

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## Introduction

It was commonly recognized that good recovery allowed better performance and reduced the number of injuries in athletes. Recovery was an important component of any physical activities (Strejcová & Konopková, 2011). Recovery could be defined as muscle in our body return to normal state after the doing exercises (Tomlin and Wenger, 2001). By speeding up the recovery process in such situations could deliver a competitive improvement to the athletes. Athletes, trainers, and coaches may use many different approaches to increase recovery and subsequent performance after exercise. It was including rest and sleep to nutritional strategies such as supplementation, to physical modalities such as massage, active recovery, and stretching (Calder, 2004). Every type of recovery had a different method and different situation hence it must be done in the right time and right procedures. Balance between competition or training and recovery was needed to increase performance and to avoid injury due to overtraining (Garcia et al., 2016).

Sprinting competitions put a sprinter's body under stress in the short-term tournament-style events, or over a longer term in competitions where athletes compete weekly (or more) over numerous weeks. Sprint athlete trains on explosive movement to explode the speed until the end point. The nature of sprint training requires the athlete to use power of explosive, power on lower body, the quickness, endurance and an agility to show their performance at maximum level (Chamari & Padulo, 2015). All these components in sprinting event cause the sprinters under stress. In these types of circumstances there might be insufficient time for athletes to recover to their optimal physiological and psychological status before the next bout of exercise (Wilcock, Cronin & Hing, 2006). Some of the sprint athletes that compete in various events on the same day can lead to fatigue. Due to that, the effective recovery was important to make sure the best performance in the next tournament or event (Crowe, O'Connor, & Rudd, 2007).

Recently, cold-water immersion recovery had emerged as one of the most popular interventions to speed up recovery (Strejcová & Konopková, 2011). Cold water immersion (CWI) was one of the cryotherapy recovery techniques that use cold method. Anecdotally, various sporting bodies, coaches, and athlete-support services suggested the use of water immersion to improve recovery (Wilcock, Cronin & Hing, 2006). Four basic types of water immersion could be achieved: cold immersion, hot immersion, alternating-temperature immersion (contrast therapy), immersion in which the water temperature was neutral in relation to body temperature (Wilcock, Cronin & Hing, 2006).

Cold water immersion had many proposed physiological effect that can help in recovery from fatigue, as well as the ability to decrease cellular need for oxygen by reducing cellular metabolism, reduced heart rate, decreased inflammation and reduced core, intramuscular and cutaneous temperatures (Eltman & Aliba, 2012). The benefit of cold-water immersion was changing blood flow (Vaile et al. 2008), thermoregulation (Peiffer et al. 2009; Vaile et al. 2010), and option of recovery (Stanley et al. 2012) which can reflect by modified the cardiac autonomic activity (Buchheit et al. 2009b; Stanley et al. 2012). Application of cold - water immersion that have been suggested by a growing body of evidence following strength exercise can speed recovery to improve the symptoms of delayed onset muscle and muscle damage (Leeder et al., 2012). Some of the readings that have been examined cold water immersion effect after strength exercise, the comparator groups have naturally included active recovery (Roberts et al., 2014), contrast therapy (i.e. alternating between warm and cold water) (Vaile et al., 2008) and warm water immersion (Vaile et al., 2008).

There were few factors that affect athlete performance such as equipment, the skills, experience and the recovery process. The entire athletes around the world seek for the best recovery method to help them recover faster after the game or training to recovery. Performance of the athlete and recovery were said that could be directly linked. Some of the game competitions had not enough time for the athlete to recover effectively between training and competitive session, that could make performance decreased (Nepocatych et al., 2015). Different types of recovery modalities, individual or combination were most used

by competitive athlete to improve recovery, decrease muscle soreness, and increase performance (Barnett, 2006). For the athlete, the balance between recovery and training / competition pressure was significant to maximize sports performance and to avoid possible disturbance leading to overtraining and a few of recovery strategy have been studied to increase the reestablishment of physiological capability to pre-exercise level and to improve performance (Garcia et al., 2016).

Furthermore, every athlete in sports competes frequently and recovery was needed to maximize the potential between competition restoration and decrease fatigue. Hence, better recovery after strong and extensive activities could help improve post-exercise physical performance and it could help following training and performance of athlete (Elias et al., 2013). Most problems for the athlete in the tournament as the period for full recovery is restricted and thus performance may decrease. Current studies had verified that residual fatigue accumulated over following matches could poorly affect team-sport performance (Ronglan et al., 2006; Spencer et al., 2005). The athletes that want to increase training and competition performance, fatigue should be decreased by recovering as fast as possible (Versey et al., 2013). The improvement of recovery from training and competition has become important aspect of increase athletic performance. The better recovery strategies after physical activity was believed to improve subsequent performance and may minimize the potential of injury (Argus et al., 2013). The purpose of this study was to study the effect of cold -water immersion and passive rest on recovery of performance among sprinter athlete.

## **Materials and Method**

This study compared two groups of recovery technique that were cold water immersion (CWI) and passive rest (PR) on skill related fitness that related to sprint athlete. The sprint athletes were from Sekolah Sukan Malaysia Terengganu and the total of them were 14 athletes which is 8 males and 7 females. The athlete's ages were ranged 13 years old until 17 years old.

The athlete undergoes 35meter sprint, standing broad jump and sit and reach. These skills were being tested before (pre-test) and after (post-test) recovery technique. All the athletes have been immersed in cold water for 15 minutes.

*Statistical Analysis*

Paired Sample t-Test was used to identify the significant of the three tests. Mean and standard deviation were analyses as a descriptive statistic.

**Result***Table 1: Descriptive Statistic*

		Minimum		Maximum		Mean		Std. Deviation	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Speed (s)	CWI	4.47	5.16	7.27	7.38	5.00	5.83	0.63	0.73
	PR	4.66	4.38	4.93	4.90	4.80	4.72	0.12	0.178
Power (m)	CWI	116	119	263	250	197.86	174.71	50.14	52.46
	PR	186	198	264	270	212.00	217.57	26.29	24.5
Flexibility (cm)	CWI	23.5	22.0	43.6	42.0	32.07	30.64	7.25	7.54
	PR	23.5	25.0	34.0	35.5	28.93	30.93	4.96	4.95

*Descriptive Statistic*

The result showed the improvement and decreases of performance among sprint athlete. Based on result, the cold - water immersion indicated decrease of performance in comparison to passive rest performance.

Speed of cold - water immersion showed decreasing of performance, pre  $5.00 \pm 0.63$  and post was  $5.83 \pm 0.73$ . Meanwhile, speed of passive rest showed that the improvement of performance, which was speed pre  $4.80 \pm 0.12$  and speed post  $4.72 \pm 0.178$ .

Power of cold - water immersion showed the decreasing of performance, which was power pre  $197.86 \pm 50.14$  and power post  $174.71 \pm 52.46$ . Meanwhile power of passive rest shows the improvement of performance, which was power pre  $212.00 \pm 26.29$  and power post  $217.57 \pm 24.5$ . Flexibility of cold - water immersion showed the decreased of performance, which was flexibility pre  $32.07 \pm 7.25$  and flexibility post  $30.64 \pm 7.54$ . Flexibility of passive rest shows the improvement of performance, which was flexibility pre  $28.93 \pm 4.96$  and flexibility post  $30.93 \pm 4.95$ .

*Paired Sample Test*

Speed of cold water immersion and passive showed the significant different for both groups, which was for cold water immersion the result,  $t(6) = -5.99$ ,  $p$  value: 0.001 which was  $p > 0.05$  and the result for passive rest is  $t(6) = 2.61$ ,  $p$  value: 0.040 which was  $p > 0.05$ .

Power of cold water immersion and passive showed the significant different for both groups, which was for cold water immersion the result, was  $t(6) = 2.84$ ,  $p$  value: 0.030  $p > 0.05$  and the result for passive rest was  $t(6) = -2.58$ ,  $p$  value: 0.042  $p > 0.05$ .

Flexibility of cold water immersion and passive showed the significant different for both groups, which is for cold water immersion the result was  $t(6) = 5.14$ ,  $p$  value: 0.002  $p > 0.05$  and the result for passive rest was  $t(6) = -9.17$ ,  $p$  value: 0.000  $p > 0.05$ .

*Table 2: Paired Sample Test*

Testing	CWI group		P value	PR		P value
	Pre	Post		Pre	Post	
35meter sprint	5.00±0.62	5.83±0.73	0.001	4.80±0.11	4.72±0.18	0.040
Standing board jump	197.86±50.14	174.71±52.46	0.030	212.00±26.29	217.57±24.5	0.042
Sit and reach	32.07±7.25	30.64±7.54	0.002	28.93±4.96	30.93±4.95	0.000

**Discussion**

*Cold - Water Immersion on Athletes*

The current finding showed that there was significant different of cold - water immersion on recovery of performance. According to past study conducted by Crowe et al., 2007 the result of cold - water immersion performance was negative when performing the test compared to passive rest. Cold water immersion had many proposed physiological effect that could help in recovery from fatigue, as well as the ability to decrease cellular need for oxygen by reduce cellular metabolism, reduce heart rate, decrease inflammation and reduce core, intramuscular and cutaneous temperatures (Eltman & Aliba, 2012). The benefit of cold - water immersion was to help the body reduce from fatigue and make the body relax for a long period of time.

The current study was in line with the previous results that revealed control group was faster in recovery than cold water immersion it because cold water immersion could reduce sprint performance that

associated with parasympathetic exercise that could reduce heart rate and performance (Parouty et al., 2010). From this journal the cold - water immersion was good use for short-term recovery between training and competition that was not provides good performance for sprint athlete and was not recommended for the anaerobic athlete user such as sprinter.

The current finding showed the performance of sprint athletes after cold water immersion was decreased. The data indicated that pre-test and post-test for cold water immersion mostly decreased due to the muscle of the athlete totally relaxes compare to passive rest. Cold water immersion makes the body relax, which means the body of the athlete return to normal before do the test. After competition the tool of recovery most used was cold water immersion and frequently recommend for coach and medical staff to decrease the believe performance decrements in repetitive exercise stress (Eltman & Aliba, 2012). Most of the coach and athlete believed that the cold water immersion could use long period of time rest which means the repetitive event that had gap for long period of time and that was be recommended that the best time use of cold water immersion.

#### *Passive Rest on Athletes*

The current study showed there was significant different of passive rest on recovery of performance among sprinter athlete. Based on the previous study, the finding said there was significant on passive rest in increasing the performance such as peak power, total work and blood lactate concentration compare to cold water immersion (Crowe et al., 2007).

The past study showed that passive rest was the best recovery method for short duration of rest durations between events. Passive rest also could reduce heart and decrease fatigue, This technique make the body relax for next game in short duration which means it could be practiced for multiple event in one day (Eltman & Aliba, 2012).

In regard of past study passive rest appeared in much better improvement in time trail from one to three in the trial compare to cold water (Stanley et al., 2013). The rest time between three trials for passive rest was in short duration which means better for passive rest compare to cold water immersion. The recovery technique of passive rest showed the positive effect on performance (Garcia et al., 2016). This due to athlete's body in preparing the muscle for physical activity.

#### *Different Between Cold - Water Immersion and Passive Rest on Athletes*

There was significant different between cold water immersion and passive rest. In previous study, it was stated that the use of cold water immersion for recovery in anaerobic exercise was more on decrease the performance when compared to passive rest (Crowe et al., 2007). The idleness post-exercise technique that makes the body returns to homeostasis which was the body is doing nothing (rest). Basic form of passive rest is sleep or bed rest. However, the current of the study, sleep will be replaced with lie down on the surface.

Based on the previous study, the finding said there was significant that passive rest increase in performance such as peak power, total work and blood lactate concentration compare to cold water immersion (Crowe et al., 2007). The result from previous study consistent with present study revealed that there was significant different between cold water immersion and passive rest on athlete performance, where cold water immersion showed the decrease of performance compared to passive rest that showed the



improvement of performance. Passive rest appeared to be the best recovery method in a short period of time compared to cold water immersion.

## Conclusion

In conclusion, there was significant effect of cold - water immersion on recovery of performance among sprinter athlete. The cold - water immersion technique gives the muscle of the athletes were totally relaxed and when the athlete undergoes a test, their muscle shown that they were totally not ready although the athlete warms up before do the test.

Furthermore, there was significant effect of passive rest on recovery of performance among sprinter athlete. The current study revealed that passive rest was the best for a short duration of rest between events in one-day compare to cold water immersion. For this recovery technique the athletes physiologically prepared and ready comparing to the athlete's condition after cold water immersion treatment. This could explain as the athletes' body is totally rest and restored to normal condition.

## Recommendation

Future scientific research should be conducted to further investigate on duration of recovery technique. Hence, the result of studying may show the effect of recovery technique in that duration. The present study suggests CWI and CWT to be promising recovery intervention. However, future studies must be conducted to enhance the body of knowledge and understanding of hydrotherapy and its' associated mechanisms.

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**THE INFLUENCE OF OBESITY PREDICTORS TOWARD  
PERCENTAGE BODY FAT AMONG ADOLESCENCES IN KELANG,  
SELANGOR.**

*Zarizi Ab Rahman*

*Ahmad Hashim*

*Rozita Ab Latif*

*Mohad Anizu Mohd Noor*

*Fakulti Pendidikan, Universiti Teknologi Mara,  
Cawangan Selangor, Kampus Puncak Alam.*

*Fakulti Sains Sukan dan Kejurulatihan, Universiti Pendidikan Sultan Idris,  
Tg Malim, Perak.*

*Fakulti Sains Sukan dan Rekreasi  
Universiti Teknologi MARA, Shah Alam, Selangor*

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**Correspondents Author,**

**Zarizi Abdul Rahman  
013 - 2291393  
Faculty of Education  
Universiti Teknologi MARA Cawangan Selangor,  
Campus Puncak Alam**

## **The Influence of Obesity Predictors toward Percentage Body Fat among Adolescents in Kelang, Selangor.**

Zarizi Ab Rahman <sup>1</sup>,

Ahmad Hashim <sup>2</sup>,

Rozita Ab Latif<sup>3</sup>,

Mohad Anizu Mohd Noor <sup>3</sup>

*<sup>1</sup>Fakulti Pendidikan, Universiti Teknologi Mara,  
Cawangan Selangor, Kampus Puncak Alam*

*<sup>2</sup>Fakulti Sains Sukan dan Kejurulatihan, Universiti Pendidikan Sultan Idris,  
Tg Malim, Perak.*

*<sup>3</sup>Fakulti Sains Sukan dan Rekreasi  
Universiti Teknologi MARA, Shah Alam, Selangor*

### **Abstract**

*Obesity among adolescents had becoming a global epidemic in recent years. It was a challenging health problem with the increasing prevalence of obesity for the group. Prevalence of obesity was not considered a health threat to humans but also increased the economic burden on families and countries. Obesity was primarily caused by an increase in body fat percentage due to the energy imbalance between calorie intake and consumption. The effects of this energy imbalance were causing the accumulation and excess of body fat. There were various factors that predict obesity such as self-efficacy, motor skills, school environment, media, community, family, nutrition, sedentary behaviour, health knowledge, physical fitness and socioeconomic status. Complex risk factors make some obesity interventions difficult to achieve successfully and most of these programs failed. The theory or model of health promotion and disease prevention programs considered the importance of the various factors, health issues that need to be addressed, and the populations involved before any preventive measures were planned and implemented. Therefore, this study aimed to determine the effect of obesity predictor factors on boys and girls aged 13 to 14 in Kelang, Selangor. This quantitative study involved 150 sample students from Seri Andalas National Secondary School, Klang, Selangor (L = 32, P = 48) and the Rantau Panjang National Secondary School, Klang, Selangor (L = 30, P = 40) through simple random sampling techniques. Predictors of obesity factors and body mass index were used to collect data. Descriptive and inferential statistics were used for data analysis. Multivariate regression analysis found that all predictor factors are significant for body fat percentage, with eating behaviour was the primary predictor. As a result, aspects of healthy eating need to specifically focus on adolescents and children in an effort to address the prevalence of obesity.*

*Keywords: Obesity, Predictors, Body Mass Index, Adolescence*

## **Introduction**

Adolescence is a critical period as it is a transition period from childhood to adulthood. This period involves many changes and developments that include biological, physical, psychological and behavioural functions. Examples of changes such as eating behaviour, physical activity, psychological health, physical fitness, and body composition (Alberga, Sigal, Goldfield, Prud'Homme, & Kenny, 2012). Thus, this period is a period for shaping adolescent behaviours in many aspects.

Healthy behaviours adopted in early adolescence would have an impact on long-term health and well-being. Therefore, the growth, development and maturity that occurs during adolescence should be on a normal stage and no change will affect the development of adolescents especially in relation to health behaviours. Obesity among teenagers have become a global epidemic in recent years. It is a very challenging health problem with the increasing prevalence of obesity for the group. Over the past few decades, obesity among school-aged children and adolescents has doubled or tripled in some developed and developing countries (Wang & Lobstein, 2006). Overweight children and adolescence are more prone to becoming overweight adult (Gordon-Larsen, The, & Adair, 2010). The National Health and Morbidity Survey report by the Ministry of Health (2017) found that 44% of Malaysian adolescents suffer from overweight and 14% obesity.

Prevalence of obesity is not only considered a threat to human health (Vinturache, McDonald, Slater, & Tough, 2015) and public health but it also increases the economic burden on families and countries as a result of treatment and medical costs. Obesity is primarily due to an increase in the percentage of body fat due to the energy imbalance between calorie intake and consumption. The effects of this energy imbalance cause the accumulation and excess of body fat. Previous studies conducted abroad have shown that obesity risk factors are complex because they involve a combination of different aspects besides producing different findings.

Among the risk factors identified are individual behaviour, environment, race, age (Lee & Yong, 2018; Wang, 2011), gender (Crispim, Peixoto, & Jardim, 2014; Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006), socioeconomic status (Mohammed & Vuvor, 2012; Pirincci, Durmus, Gundogdu, & Aik, 2010). These factors have an impact on obesity among adolescents that vary by location, gender, age and so on. While, the Ahmad, Zulaily, Shahril, Abdullah, and Ahmed (2018), reported gender, household size, occupational level, household income and household income level are the predictors of obesity among adolescents.

The complex risk factors that drive some obesity interventions are not well-managed and many of these programs to be unsuccessful. The theory or model of health promotion and disease prevention programs explains the importance of considering various factors, health issues that need to be addressed, and the population involved before any preventive measures are planned and implemented. WHO (2019), proposed that risk factors contributing to an increase in overweight and obesity need to be identified in order for better control and preventing the prevalence of obese. Additionally, identifying risk factors for adolescents will be able to provide information to curb the increasing prevalence.

A clear understanding of the relevant factors would help to develop effective intervention policies and programs. Although many studies have been conducted on the factors of obesity, the impact and influence of obesity predictors in adolescents especially in recent years was still unclear in rural areas. Therefore, this study aimed to determine the impact and influence of obesity predictor factors on boys and girls between the ages of 13 and 14 in Kelang, Selangor.

## **Literature Review**

Rapid socioeconomic transformation in developed and developing countries have affected lifestyle changes (Caballero, 2001; Drewnowski & Popkin, 1997). Recent studies (Chao, Shih, Wang, Wu, Lu, Chang, & Yang 2014; Peltzer, Pengpid, Samuels, Ozcan, Mantilla, Rahamefy, & Gasparishvili, 2014) revealed that socioeconomic status is considered one of the major contributing factors to obesity and overweight. While Brown, Broom, Nicholson, & Bittman, (2010) explaining that family and adolescents' social and personal well-being affects the body mass index.

Previous studies (Gittelsohn, Trude, Poirier, Ross, Ruggiero, Schwendler, & Anderson, 2017 ; Schwartz, King, Perreira, Blundell, & Thivel, 2017; Ek, Sorjonen, Nyman, Marcus, & Nowicka, 2015; Okubo, Miyake, Sasaki, Tanaka, Murakami, Hirota, & Osaka, 2014) found lifestyle, socioeconomic status, physical activity, and nutrition behaviour are major risk factors for obesity in children and adolescents. Lifestyle, health-related knowledge, social policy, neighbourhood characteristics are some of the key factors contributing to the worldwide epidemic of obesity (Yen, Chen & Eastwood 2009). This further suggested that obesity factors included behavioural, environmental, and individual factors.

Poor diet among the major contributors to excess body fat (Chee, Zawiah, Ismail, & Ng, 1996). Excessive dietary intake coupled with deficiencies in physical activity results in energy imbalances that may lead to weight gain. Changes in the dietary structure known as western have hit the world (Popkin, 2001). The composition of the food structure in western diets involves high fat and processed carbohydrate. Knol, Haughton, dan Fitzhugh (2005), revealed positive relationship between sugar sweetened, high fat junk food, snacks, and low nutritional quality in children and adolescents with obesity. The risk of obesity is becoming more serious with the lack of physical activity. The Australian Physical Activity Guide recommends that teens between the ages of 13 and 17 years of age have to undergo at least 60 minutes of daily physical activity with moderate intensity (Department of Health & Ageing, 2004). Regular physical activity was an important component of energy balance and it was the only method that could burn calories to avoid the risk of weight loss and obesity. Low levels of engagement and failure to meet these standards increased the risk for weight gain and other chronic diseases.

Sedentary behaviour was often referred to as any activity or behaviour that involves low energy expenditure (Hamilton, Hamilton & Zderick, 2007) such as sitting for a long time, reclining or lying posture. Watching television and using the computer for a long time was part of sedentary behaviour (Ainsworth, Haskel, Whitt, Irwin, Swartz, Strath, O'brien, Basset, Scmitz, Patricia, Jacobs, & Leon, 2000). Findings from previous studies shown that obesity was associated with screen time (Hardy, Wilson, Thrift, Okely & Baur, 2010; Mark and Janssen 2008) by watching television and using computers (Mark & Janssen; 2008). In the United States, watching television was a major activity of sedentary behaviour, while children and adolescents ages 8 to 18 were more interested in using a computer that had internet access than watching television (Rideout, Foehr, & Roberts 2009). Such situations gave the impression that using a computer with internet access was a priority for today's teenagers, although they may have to sacrifice their leisure time for recreational activities. It can thus be suggested that computer and internet use were activities that replace other activities in their life today.

Physical environment included building environment, transport infrastructure, pedestrian walkways, neighbourhoods, nutrition resources, and recreational facilities where people live, work, study, eat, and play (Sallis & Glanz, 2006). Behaviours and decisions by individual may have links to available environmental resources. Furthermore, unsafe neighbourhoods can cause a decline in recreational and physical activity (Veitch, Salmon & Ball, 2010; Maddison, Hoorn, Jiang, Mhurchu, Exeter, Dorey, Bullen, Utter, Schaaf, & Turley, 2009) because society is threatened by unsafe situations.

Family institutions play an important role in shaping children's behaviour in all aspects of life including healthy lifestyle practices. Children raised in families with unhealthy eating habits and sedentary lifestyles may be at risk for obesity in adolescence (Arizona State University, 2005). While the primary role of the school was to educate students in academics, values, and social responsibility in an effort to build student potential (Story, Nannery dan Schwartz 2009). Physical and Health Education (PHE) subject was a core subject taught in primary and secondary schools throughout Malaysia that focuses on health aspects. Physical activity conducted in the subject of PHE can contribute to healthy heart, muscle tissue, reduce the risk of chronic diseases, and improve self-esteem (Stellino dan Sinclair, 2014). Wang (2001), reported that family income and residential location were associated with increased risk for obesity for children and adolescents. Mohd Ismail (2002) and Sakinah, Seong-Ting, Rosniza, and Jayah (2012), reported that adolescents living in cities tend to be obese. This relationship may be seen from the point of view of dietary tendencies that tend to be high in fat and high calorie diet in lieu of traditional diet. In addition, this population also tends to adopt a sedentary lifestyle (Tesfalem, Singh, & Debebe 2013) such as watching television excessively (Ferreira, Horst, Wendel-Vos, Kremers, van Lenthe & Brug, 2007) on the basis of the ability to have paid television service, computers with high speed internet access, electronic gadgets, motor vehicle use.

Chivers (2010) identified individual and cognitive factors including individual, motor competence, health-related knowledge, and physical fitness. Motor skills competence was the mastery of physical skills and movement patterns that affect pleasure in participating in physical activity (Castelli & Valley 2007). Adolescent participation in sports and games activities because of motor competent and level of physical fitness. Okely, Booth and Chey (2004), found that locomotor skills were positively associated with the body mass index in adolescents. Therefore, children or adolescents who incompetent in motor skills and low level of fitness may find it difficult to engage in physical activity or games that will lead to an increase in their weight status.

Physical fitness was closely related to involvement in physical activity (McGuire & Ross 2011). Regularly engaging in physical activity could increase level of physical fitness. High levels of physical fitness were the important factors in maintaining weight and reducing the risk of cardiovascular disease (Lee, Blair & Jackson 1999). Chen, Fox, Haase and Wang (2006), observed that the physical fitness level of obese children was lower than that of children with normal weight status. This shows that physical fitness was an important element of maintaining ideal weight. In addition, health-related knowledge is an essential element of understanding and reducing the level of the body mass index (Wilson, 2009). Adolescents with nutrition-related knowledge had shown a positive attitude towards behaviour.

## Research Methodology

This study was conducted using survey design. Survey studies could provide accurate measures for the large populations (Azizi, Shahrin, Jamaludin, Yusof & Abdul Rahim, 2007). It also can predict the phenomenon because a comprehensive study sample be used to understand the cause of a phenomenon (Sidek, 2002). A simple random sampling method was used to determine the sample size and location for this study. This research consider recommendation by Cohen's (1988) in terms of sample size. According to Cohen (1988) significance level  $\alpha = .05$ , effect size .50 (medium), and power level at .80 (high) often used in social health knowledge studies. This sample size was subject to multiple regression assumptions (Tabachnick & Fidell, 1996). Therefore, 150 respondents from Seri Andalas National Secondary School, Klang, Selangor (boys = 32, girls = 48) and Rantau Panjang National Secondary School, Klang, Selangor (boys = 30, girls = 40) were selected as a sample size and location for this study.

Field method body composition measurement was used to determine body fat percentage, while the obesity factor predictor instrument (Zarizi, 2017) to measure the influence of predictors on



obesity factors on body fat percentage. Body Mass Index was used to determine the percentage of body fat among obese adolescents. Zarizi (2017) revealed BMI was the most accurate and reliable field method instrument in that populations. Percentage of body fat be obtained using the following formula:  $BF\% = 1.51 \times BMI - 0.70 \times \text{age} - 3.6 \times \text{gender} + 1.4$  (male = 1, female = 0) (Deurenberg, Weststrate, & Seidell, 1991). The obesity factor predictors questionnaire (Zarizi, 2017) contains 58 items measuring 11 constructs including eating behaviour, sedentary behavior, family environment, school, community, media, socioeconomic, physical fitness, motor competence, health knowledge, and efficacy self. This instrument uses a 5-point Likert Scale (1 strongly disagree, 2- disagree, 3- uncertain, 4- agree, 5- strongly agree).

## Results

The data were analysed using SPSS Version 22 to obtain descriptive statistics (mean and standard deviation) and inferential statistics (multiple regression). Multiple regression analyses were used to determine the influence of predictors obesity factors on students aged 13 to 14 in Klang district. A total of 11 predictor variables (predictors) or independent variables were used in this study. The results in table 1 showed that students between the ages of 13 and 14 obtained average body fat percentage (M = 22.00kg /m<sup>2</sup>, SD = 5.59), self-efficacy (M = 28.56, SD = 8.78), motor skills (M = 17.65 , SD = 5.48), school environment (M = 14.67, SD = 5.07), media environment (M = 10.92, SD = 3.97), community environment (M = 17.82, SD = 6.54), family environment (M = 7.17, SD = 1.97), eating behaviour (M = 14.80, SD = 4.30), sedentary behaviour (M = 9.30, SD = 2.67), health knowledge (M = 13.28, SD = 4.68), physical fitness (M = 11.60, SD = 3.45), and socioeconomic (M = 14.89, SD = 4.82)

Table 1: Body Fat Percentage and Obesity Predictors Factor Among Adolescence

Variables	Mean	SD	N
Body fat Percentage	22.00kg/m <sup>2</sup>	5.59	150
Self-Efficacy	28.56	8.78	150
Motor Competence	17.65	5.48	150
School Environment	14.67	5.07	150
Media Environment	10.92	3.97	150
Community Environment	17.82	6.54	150
Family Environment	7.17	1.97	150
Eating Behaviour	14.80	4.30	150
Sedentary Behaviour	9.30	2.67	150
Health Knowledge	13.28	4.68	150
Physical Fitness	11.60	3.45	150
Socio Economic	14.89	4.82	150

The results of the multiple regression analysis as shown in Table 2 indicated predictors of obesity factor variables had a significant influence on body fat percentage, (R-Squared = 0.85, F (11, 138) = 72.97, p = 0.00). Correlation analysis of multiple regression coefficients was R = .92. As much as 85 percent of the variance in obesity predictor factors can be explained by the linear combination of scores in body fat percentages.

Table 2: Model Summary

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std Error of Estimate
1	0.92 <sup>a</sup>	0.85	0.84	2.23

a. Predictors: (Constant), Socio-economic, family environment, media, sedentary behaviour, knowledge, school environment, physical fitness, community environment, motor competent, self-efficacy, eating behaviour.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3986.23	11	362.38	72.97	.000 <sup>a</sup>
	Residual	585.33	138	4.97		
	Total	4671.56	149			

a. Predictors: (Constant), Socio-economic, family environment, media, sedentary behaviour, health knowledge, school environment, physical fitness, community environment, motor competent, self-efficacy, eating behaviour.

b. Dependent Variable: Body Mass Index

coefficients (a)

Model	Unstandardized Coefficients			t	Sig.	Correlations Partial
	B	Std. Error				
1	(Constant)	1.486	.854	1.740	.084	
	Self-Efficacy	.125	.042	2.983	.003	.246
	Motor competence	.179	.062	2.903	.004	.240
	School environment	.024	.070	.339	.035	.029
	Media environment	.074	.064	1.155	.050	.098
	Community environment	.131	.051	2.585	.011	.215
	Family environment	.248	.123	2.019	.044	.169
	Eating behaviour	.383	.089	4.330	.000	.346
	Sedentary lifestyle	.187	.105	1.785	.027	.150
	Health Knowledge	-.057	.057	-.996	.021	-.084
	Physical fitness	.152	.091	1.676	.036	.141
	Socio economic	.006	.074	.080	.016	.007

a. Dependent Variable: Body Mass Index

b. Regression equation:-

$$+0.125self\ efficacy + 0.179motor\ competence + 0.24school\ environment + 0.74media\ environment + 0.131\ community\ environment + 0.248\ family\ environment + 0.383\ eating\ behaviour + 0.187\ sedentary\ life\ style - 0.057knowledge + 0.152physical\ fitness + 0.006\ socio-\ economic + 1.486$$

The analysis results in Table 3 explained that all the predictors variables had an influence on body fat percentage. Findings indicated that predictors of self-efficacy, motor skills, school environment, media environment, community environment, family environment, eating habits, sedentary behaviours, health knowledge, physical fitness, and socioeconomic status showed high and significant influence on body fat percentage. Eating behaviour predictors accounted for most of the variance in body fat percentages by 71 percent (.845 x .845 = .714). Other contributors accounted for 14 percent (85% - 71%) as additional contributors.

Table 3: Correlation between Predictors Factor and Body Fat Percentage.

Predictors	Correlation predictors and body fat percentage	sig.
Self-efficacy	.803	.003
Motor competence	.777	.004
School environment	.745	.035
Media Environment	.642	.050
Community environment	.756	.011
Family environment	.444	.044
Eating behaviour	.845	.000
Sedentary behaviour	.687	.027
Health Knowledge	.622	.021
Physical fitness	.752	.036
Socio economic	.754	.016

## Discussion

The results showed that all of the predictors in this study consisted of self-efficacy, physical fitness, health knowledge, motor skills, school environment, family environment, community environment, media environment, socioeconomic status, sedentary behaviour, and eating behaviours showed a significant effect and influenced percentage of body fat among students aged 13 to 14 in Klang district, Selangor. However, finding indicated eating behaviour was the strongest predictor. This finding was in line with previous findings (Obregon, Pettinelli, & Santos, 2015; Patrick, & Nicklas, 2005). Unhealthy eating habits such as excessive calorie intake among the contributors to the prevalence of obesity among adolescents. Fast food was very popular among children and adolescents. Some of the popular fast food items include fries, burgers, fried chicken, pizza, donuts, and more. With the emergence of many fast food restaurants, society could have easier access to the food regardless of time. Most of the food and beverages available in these restaurants were from high-calorie and high-fat foods such as snacks and sweetened drinks (Obregon, Pettinelli, & Santos, 2015; Al-Rethaiaa, Fahmy, & Al-Shwaiyat, 2010). While Guthrie, Lin, and Frazao (2002) found that foods served in restaurants typically contain high amounts of calories, high fat and low in fibre, calcium, and iron content.

According to Anderson, Rafferty, Lyon-Callo, Fussman, Imes (2011)., Patrick and Nicklas, (2005), most adolescents today prefer to eat fast-food restaurants and tend to eat in large quantities. Meals in fast food restaurants were recognized as high-calorie foods and drinks. Findings from Collison, Zaidi, Subhani, Al-Rubeaan, Shoukri, and Al-Mohanna (2010) confirmed that consuming soft drinks and fast food was an unhealthy dietary behaviour. Although Rosenheck (2008) stated that it was difficult to pinpoint the causal relationship between fast food intake and obesity, but fast food had been categorized as an unhealthy diet associated with obesity (Anderson, Rafferty, Lyon-Callo, Fussman, & Imes, 2011; Bowman, & Vinyard, 2004; Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003). Whereas Fraser, Clarke, Cade, and Edwards, (2012) found that eating fast food among adolescents was significantly associated with increased Body Mass Index and body fat percentage. There was strong evidence that consuming fast food and sweet drinks in large quantities was positively associated with obesity (Collison, Zaidi, Subhani, Al-Rubeaan, Shoukri, & Al-Mohanna, 2010; Niemeier, Raynor, Lloyd-Richardson, Rogers, & Wing, 2006). Daily diets high in saturated fat and sugar content had been shown to increase weight, insulin resistance, hyperlipidemia and metabolic syndrome (Basciano, Federico, Adeli, 2005; Kromhout, 2001). According to Astrup and Finer (2000) the metabolic syndrome, also referred to as "diabesity", is an increase in diabetes in combination with obesity as a result of changes in behaviour, diet, and lifestyle. Fast food was usually fried and high content of saturated fat. This directly increased one's weight if taken too much.

Excessive calories in high calorie foods and sugary drinks eventually be stored as fat which lead to weight gained.

## Conclusion

This study's results provided the first impression that self-efficacy, physical fitness, motor skills, health knowledge, school environment, media, community, family, socioeconomic, nutritional, and self-efficacy were among the contributors to the prevalence of obesity among adolescents. Moreover, the findings showed that large contributors such as nutrition behaviours can provide information that prevention methods through nutrition education should be emphasized especially in the early stages of schooling. Students needed to be exposed to healthy foods such as dietary guidelines, food pyramids, and calorie counting. Teaching and learning activities Physical and Health Education should be implemented with more interesting techniques and methods to make an impact to the students, especially in the areas of healthy nutrition knowledge. In addition, parents and the community need to be more sensitive to issues related to nutrition so that adolescents and children would not be exposed to unhealthy foods.

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