THE EFFECT OF TRADITIONAL GAMES INTERVENTION PROGRAMME IN THE ENHANCEMENT SCHOOL-AGE CHILDREN'S MOTOR SKILLS: A PRELIMINARY STUDY

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Abstract

The purpose of the current study is to explore the effectiveness of the traditional games intervention programme in the enhancement of form one school-age children's motor skills. The quasi-experiment method is applied. A total number of 40 Malaysian children with ages ranging from 12 – 14 were randomly selected for the study, [boys (n=20) and girls (n=20)]. The children went through the traditional games intervention which consisted of performing selected traditional games for 60 minutes, three times weekly for a period of eight weeks. Motor fitness performance tests were conducted three times (pre, mid, and post-test) which included 30-meter sprint test, 505 agility test, modified Bass test for dynamic balance and Nelson reaction times test. The data were collected and analysed using MANOVA repeated measurement. The results show that traditional games intervention was effective in the improvement of motor performance [$F(8, 29) = 1704.16$, $p < .05$]. Follow-up tests also show that the traditional games intervention is a factor [$F(12,105) = 1.99$, $p < .05$] to agility [$F(3,36) = .50$, $p > .05$], reaction time [$F(3,36) = .51$, $p > .05$], speed [$F(3,36) = 3.64$, $p < .05$] and balance [$F(3,36) = .02$, $p > .05$]. The result from this initial study demonstrated that Malaysian based traditional games could be efficient in improving the motor skills of school-age children.

Keywords: Traditional games, Motor skills, School–age children, Quasi-experimental

Introduction

Physical ability is fundamental for cognitive enhancement during early adolescence. Montessori (1967) asserted that, for estimating out how to reach its peak capability, it must be directly related to the physical development of the children. Motor skills are a crucial aspect of development for all adolescents. To this effect, Gallahue (1993) described that exercise plays a vital role in adolescents' lives. It is essential for their development in the motor, cognitive, or affective domains behaviour. It is, thus, pertinent to mention that to revoke children the chance to participate in numerous physical activities is to deny them the chance to match the delight of energetic development, well-being and a sense of confidence to exercises. Similarly, Piaget (1950) expressed that from the early school days of life, children start utilising their bodies to find out about their general environs. At that age, they require physical activity to develop strength, coordination and confidence which will prompt them to lay down the preparation for a healthy lifestyle through obtaining further control over how active they are (Olufemi & Musa 2016). Thus, it is suitable to add that this can be accomplished efficiently when the children are involved in physical exercises that are both invigorating and enjoyable.

The older generation sports otherwise identified as traditional games, are succeeded physical activities performed very regularly after harvest season mostly by farmers (Addy Putra, Shahrul, Nor Ziratul Aqma, & Amirul, 2014; Ekunsanmi, 2012; Tatira, 2014). Traditional games were taken over from the earlier generation and passed on to the young generation through oral, sound or presentations. It has been reported that these traditional games have a racial and cultural value (Civarello, 2006) and are categorised as part of the recreational activity (Addy Putra et al., 2014; Mohd. Salleh, 2005). The games are performed for pleasure, intent and tranquillity of mind (Ekunsanmi, 2012; Sahay, 2013).

Among the various types of traditional games played by the older generation in Malaysian perspective, were *sepak bulu ayam, burung masuk sarang, gasing, marbles, petik mata, congkak, kite, batu seremban, buat rumah batu, galah panjang, tok harimau,* and *tor duduk* (Aziz & Wan Ramli, 1994; Shafiee, 2008). These traditional games are played at no monetary cost. The materials needed for the performance of the games are obtained from the surroundings or recycled. For example, the *Buat Rumah Batu* game uses only stone. In fact, in some of the traditional games, no materials are needed at all such as *Tok Harimau, Tor Duduk* and *Galah Panjang* (Aziz & Wan Ramli, 1994). The aforementioned traditional games are very popular in Malaysia and had been played by the older generation across a wide range of ages, races, and cultures. The games involve a lot of movements, which are mostly related to the activations of motor fitness components (Aziz & Wan Ramli, 1994; Ekunsami, 2012; Sahay, 2013; Shafiee, 2008).

The game of *Buat Rumah Batu* requires agility, reaction time, and balance while moving or jumping into every compartment, Galah *Panjang* needs agility, reaction time, speed, and balance when the participants want to pass across the opponents' field of control, while *Tok Harimau* and *Tor Duduk* also involves the inter-reaction time, agility, speed, and balance to evade the opposing players who would be chasing after them (Aziz & Wan Ramli, 1994; Shafiee, 2008). However, there is no scientific studies that have been carried

out to identify the effectiveness of traditional game interventions (*Buat Rumah Batu, Galah Panjang, Tok Harimau, and Tor Duduk*) on the agility motor component chosen such as agility, reaction time, speed, balance.

Despite the existence of a number of studies and the evidence provided from the studies that traditional games offer numerous benefits such as strengthening coarse and delicate motor skills (Akbari, Abdoli, Shafizadehkenari, Khalaji, Hajihosseini, & Ziaee, 2009; Borhannudin, Saidon, Kok, & Bahaman, 2013) as well as developing cardiovascular condition (Rauber, Boullosa, Carvalho, Moraes, Sousa, Simoes, & Campbell, 2014), it is growing into more and more unpopular and less engaged in by the younger generations nowadays. The reason slightly, for the declining the reputation of the games among the younger generation today is the expeditious industrial advancement, where the young people are more appealing to watching television, playing electronic games i.e. video and computers, at home without considering the time squandered (Akbari et al., 2009; Ekunsanmi, 2012).

Traditional games formerly were very popular and played in the evening by a range of ages (Ekunsanmi, 2012; Sahay, 2013). Nowadays, the younger generation are more interested in indulging in a variety of high-tech toys like video games and computers as well as their habit of watching television more than the wish to play in sports (Addy Putra et al., 2014; Akbari et al., 2009; Ekunsanmi, 2012). A study conducted by Ekunsanmi (2012), reported that out of the 77% who used to play the traditional *Yoruba* game of Arin, only 18% are still practising it. This is due to lack of exposure to traditional games of the current generation on their importance to improving both their health and sporting abilities.

Previous researcher i.e. Lazar (2005), Nyota and Mapara (2008), Piech and Cieslinski (2007), Rouhi (2012), Sahay (2013), and Tatira (2014) expressed that determination of the types of motor fitness components built through these traditional games are important because the movement, concentration and adaptation in a skill can be developed through a wide range of traditional games. Among other factors affecting the performance of the motor is the principle of progressive overload, which refers to the addition of the number of occurrences of the training (Kreamer, Ratamess, & French, 2014), genetic factor, namely the background of good sports achievement, among family members has the potential to achieve better motor performance as compared to others (Davis et al., 1986; Lidor et al., 2009; Malina & Mueller, 1981) and social factors which support and encouragement from his teammates or coaches stimulate individual improvement (Hill, McLaughlin, Moors, Procter, & Randerso, 2007; Swain & Leutholtz, 2002; Weust & Bucher, 2006). Respondents involved in this study are those between the ages of 12 to 14 years, which implies that both genders are already experiencing biological and psychological maturity (Jones, 1993; Saltin, 2007), and could have the same capacity on the aerobic and anaerobic (Albernethy et al., 2005) and the same skill level (Carlson, 1988).

Thus, the study of the contribution of each type of traditional game of physical and motor fitness (agility, speed, balance, and reaction time) improvement should be carried out to provide information to assisting stakeholders such as physical education teacher, coaches for improving and optimisation of sporting performance in a cost-effective manner. Hence

the purpose of the current study is to explore the effectiveness of the traditional games intervention programme in the improvement of form one school-age children's motor skills related performance components which is agility, speed, balance and reaction time. In addition, this study also aims to identify the traditional games intervention that contributed the most to the improvement for each type of motor fitness components.

Materials and Methods

Participants: 40 respondents (20 male and 20 female) were randomly selected and divided into four group according to the types of traditional games intervention programme with the same 5 number of people for each gender making it 10 people (5 men and 5 women) for each group (Group: *Buat Rumah Batu, Galah Panjang, Tok Harimau* and *Tor Duduk*).

Selected traditional games for the study

Among the types of traditional games selected by the researcher as intervention program are *Galah Panjang, Buat Rumah Batu, Tok Harimau,* and *Tor Duduk*. The *Galah Panjang,* also known as *gelap cerah* game, is a type of game that requires the player to cross the lines of an obstacle course that aims to test the skill of the player running past the obstacles. The *Buat Rumah Batu* or *Ketingting* is a game where one throws a *kor* on to a partition and then hops on to the partitions with only one leg before retrieving the *kor* (Aziz Wan Ramli, 1994). Likewise, for *Tok Harimau,* and the *Tor Duduk*, which is also known as *Acikai Duduk* game aims to test the efficiency of the player to catch other players. The number of players in these games are not limited, that is, the more the players the more it could be enjoyable (Aziz & Wan Ramli, 1994).

Protocol

The programme included an eight-week period of selected traditional games. The length of each session was 60 minutes, three days a week and consisted of three parts whereas, warm-up (5 minutes: slow jog and stertching), traditional games intervention programme (60 minutes) and cooling down (5 minutes: walking and stretching). Whereas, each gender played together in their respective group (Buat Rumah Batu, Galah Panjang, Tok Harimau dan Tor Duduk) with the distribution of the length of game time week 1-4: 15 minutes per cycle (4 cycles) and week 5-8: 10 minutes per cycle (6 cycles).

Data collection procedure

505 agility test (Johnson & Nelson, 1986), Nelson response test (Baumgartner, Jackson, Mahar, & Rowe, 2006), 30-meter sprint test (Ahmad, 2004) and modified Bass test for dynamic balance (Johnson & Nelson, 1986) were selected to measure respondents motor skills related performance components (agility, reaction time, speed and balance). All measurements were taken at the beginning of the programme (pre-test), and the end of week 4 (mid-test) and 8 (post-test).

Statistical Analysis

The data for the both gender were analysed together. The data for 505 agility test, Nelson response test, 30-meter sprint tests are measured in units per seconds while modified Bass test, on the other hand, use the number of successful time of completion, a general standardisation unit of motor fitness test transformation process was employed to convert raw scores of various units to a standard form of scores as suggested by the previous researcher (Ahmad, 2003). Descriptive and inferential statistics were performed using SPSS version 20 for windows. To organise and summarise classification of the data, descriptive statistics (mean and standard deviation, drawing tables) and the multivariate analysis of variance (MANOVA) repeated measure was used at a confidence level of $p \leq 0.05$.

Result

Table 1: Descriptive statistics of achievements according to motor fitness component.

Test	n	Pre		Mid		Post	
		M	*SD*	*M*	*SD*	*M*	*SD*
505 agility	10	10.22	0.39	10.13	0.41	10.01	0.42
Nelson response	10	2.49	0.22	2.39	0.22	2.28	0.24
30-meter sprint	10	6.37	0.26	6.22	0.28	6.13	0.31
Modified Bass	10	63.30	2.42	77.90	2.35	97.20	2.67

Table 1 shows the descriptive statistics of raw data achievements according to motor performance in pre, mid and post-test. The mean, standard deviation and number of the parameters are shown.

Table 2: The MANOVA with repetitious measurement to determine the relation between motor fitness performance with the traditional games intervention programme.

Effect		Value	F	Hypothesis df	Error df	p
Within Subjects	Pillai's Trace	.998	1704.158 [b]	8.000	29.000	.000

Table 2 projects the MANOVA analysis test. The Multivariate Pillai's trace indicates $F(8,29) = 1704.16$, $p < .05$ which revealed that there is significant relationship between motor performance and traditional games intervention programme.

Table 3: The MANOVA with repetitive measurement to determine the effect of traditional game intervention programme with the motor performance.

Effect			Value	F	Hypothesis df	Error df	p
Between Subjects	group	Pillai's Trace	.556	1.99	12.000	105.00	.032

Table 3 shows the MANOVA analysis test. The Multivariate Pillai's trace t indicates F (12,105) =1.99, $p < .05$ which revealed the effectiveness of traditional game intervention programme in the motor performance.

Table 4: Analysis Between-Subject Effects to determine the differentiate effect of each traditional game intervention on the agility component.

Source	Type III Sum of Squares	df	Mean Square	F	p
Group	153.99	3	51.33	.495	.688
Error	3731.55	36	103.65		

Table 4 shows the analysis between-subject effect test to determine the differentiate effect of each traditional game intervention on the agility component. The result indicates F(3,36) = .50, $p > .05$, which showed that there is no different effect of each traditional game intervention on the agility components.

Table 5: Analysis Between-Subject Effects to determine the differentiate effect of each traditional game intervention on the reaction time component.

Source	Type III Sum of Squares	df	Mean Square	F	p
Kumpulan	156.29	3	52.09	.508	.680
Error	3695.64	36	102.65		

Table 5 shows the analysis between-subject effect test to determine the differentiate effect of each traditional game intervention on the reaction time component. The result indicates F(3,36) = .51, $p > .05$, which revealed that there is no different effect of each traditional game intervention on the reaction time component.

Table 6: Analysis Between-Subject Effects to determine the differentiate effect of each traditional game intervention on the speed component.

Source	Type III Sum of Squares	df	Mean Square	F	p
Group	899.47	3	299.82	3.64	.022
Error	2969.12	36	82.48		

Table 6 shows the analysis between-subject effect test to determine the differentiate effect of each traditional game intervention on the speed component. The result indicates F(3,36) = 3.64, $p < .05$, which revealed that there is a different effect of each traditional game intervention on the speed component.

Table 7: Analysis Between-Subject Effects to determine the differentiate effect of each traditional game intervention on the balance component.

Source	Type III Sum of Squares	df	Mean Square	F	p
Group	4.33	3	1.44	.017	.997
Error	3074.46	36	85.40		

Table 7 shows the analysis between-subject effect test to determine the differentiate effect of each traditional game intervention on the balance component. The result indicates $F(3,36) = .02$, $p > .05$, which revealed that there is a different effect of each traditional game intervention on the balance component.

Table 8: Descriptive statistics of the total different effect of motor performance from pre to post test of the traditional games intervention programme.

Test	Group	Different performance (*M*)		
		pre-mid	mid-post	total
10 metres shuttle run	*Tor duduk*	2.81	3.91	6.72
Nelson response for leg	*Galah panjang*	5.15	6.88	12.03
30 metres sprint	*Tok harimau*	4.75	6.46	11.20
Modified Bass	*Buat rumah batu*	57.24	86.26	143.50

Table 8 shows the descriptive statistics of the total different effect of motor performance from pre-to post test of the traditional games intervention programme. The result indicates that agility component contributed more by *tor duduk*, reaction time by *galah panjang*, speed by *tok harimau*, while balance by *buat rumah batu*.

Discussion

The general findings of the current study established that traditional game intervention programmes have a substantial association with motor fitness performance among the school age children as indicated in Table 2. The findings suggested that the traditional game intervention could be applied to develop motor fitness performance, i.e. fitness, speed, reaction time, speed and balance components. These discoveries uphold the findings of Rouhi (2012) and Pasand et al. (2014) on the efficiency of the traditional games in increasing agility, speed and balance variables.

Furthermore, the results of the present study revealed that motor fitness performance increased among the study participants in the fourth week of the mid-test. In fact, the further enhancement was observed through the eighth week of the post-test. These demonstrate that the traditional game intervention programme was highly effective to improve the motor fitness performance (agility, reaction time, speed, and balance) among the children. The results of this study support the results of the findings carried out by Cheung and Ng (2003) where they found that the physical fitness level of 30 sampled adolescence of aged 14 years to 18 years have shown an increase in the fourth and eighth week by circuit training method.

The current preliminary finding also discovered that traditional games intervention provided significant effects ($p < 0.05$) on the overall motor fitness performance of the children as can be observed in Table 3. This demonstrated that traditional games intervention is a factor to improving motor fitness performance. However, the results of the analysis found that traditional game interventions gave the same effect for agility, reaction time, and balance component ($p > 0.05$). The reason being, the need for agility in

all traditional games. During the game, the children strive to avoid being 'terminated' by the opposing side in a game of *Galah Panjang, Tok Harimau, and Tor Duduk*, while *Buat Rumah Batu* game used agility to spin the body by changing the feet position in partitions 7 and 8 compartments. Where the player must turn his body while adjusting his feet position upon reaching the 7th and 8th compartments before continuing back to the starting compartment. This finding is in concord with that of previous researchers who reported that agility could be affected by strength, speed, balance, and coordination factors (Miller, 1998; Stafford-Brown et al., 2007). Similarly, Ahmad (2004), inferred that the agility component could be improved by adding the capability of strength, speed, balance and coordination either through teaching, training or practice drills.

Traditional games intervention programme in our study also provides the same effects on the motor fitness performance in reaction time component (see Table 5). The reaction is considered faster when one stimulation sign was received compared to multiple stimulations because there would be many options for a response to the multiple stimulations (Stafford-Brown et al., 2007). In traditional games, reaction time play a central role to escape from the control of or being caught by the opposing team in the traditional games of *Galah Panjang, Tok Harimau,* and *Tor Duduk*. The players need to be agile, quick and balanced while producing relevant moves with stimulated by the opponents. Meanwhile, the reaction time in Buat Rumah Batu game is when the player drops and catches the *Kor* that was placed on the head before throwing the *Kor* to get a 'home'.

However, the researchers found that all traditional games intervention programs for *Galah Panjang, Buat Rumah Batu, Tok Harimau,* and *Tor Duduk* yielded significantly different effects on the motor fitness performance for speed component (see Table 6). The differences were due to the differences in the aspects of the movement space size, such as the field/court sizes of the *Tok Harimau* and *Tor Duduk* is wider compared to the size of the partitions of *Galah Panjang* and *Buat Rumah Batu*. The action of the player to avoid from being caught by the opposing side in the games of *Tok harimau* and *Tor Duduk* game is one of the requirements of speed in traditional games. The speed component is closely related to the strength component and is one of the important components in most games and sports, where this component is very important in events involving acceleration or keeping away from the opposing side (Ahmad, 2004).

The effectiveness of traditional games intervention programme is also found to have significant effects on motor fitness performance for balance component (see Table 7). This is due to the balance component being affected by the efficiency of the visual information integration to the semi-circular vestibular system and muscle receptors (Stafford-Brown et al., 2007; Woollacott Shumway-Cook, 1990), as well as the strength of the legs (Ahmad (2004). For example, in the game of *Buat Rumah Batu,* the one-legged jumping action requires the strength of the leg to support balance while jumping to the following partitions (Aziz & Wan Ramli, 1994). Therefore, the overall findings of this study support the findings of Clements et al. (2008), Eichberg (2005), Pasand et al. (2014), Rouhi (2012), Sahay (2013) and Tatira (2014), which traditional games contribute differently to physical fitness.

The total mean difference demonstrates the contributions of the traditional games intervention programmes (*Galah Panjang, Buat Rumah Batu, Tok Harimau, and Tor Duduk*) on the motor fitness performance (agility, reaction time, speed, and balance) in all the three tests (pre to post test). The overall mean results show that intervention game for *Tor Duduk* provided the most performance improvement for agility component. The reason being in *Tor Duduk*, players have the opportunity to fake moves to avoid being 'touched' or 'terminated' by the opposing team player and the distance between opposing players are farther apart in comparison to other games such as *Tok Harimau*.

Galah Panjang provided the most motor fitness performance enhancement in reaction time. According to Baker et al. (2007), the reaction time is the time between the start of the movement and stimulation. Based on the observations made by the researchers during the study, it was found that in the *Galah Panjang*, many children use reaction time to respond every time an opponent player attempts (stimulation) to touch opposing teams from crossing the line.

Based on the findings of the study, the researcher found that the *Tok Harimau* contributed to an increase in the motor fitness performance achievement in speed which is paramount. This could not be denied because of the wider *Tok Harimau* game space or court size and the need for the study participants to quickly escape from being caught by *Tok Harimau* and for *Tok Harimau* themselves to quickly turn and chase or pursue other players. Unlike *Tor Duduk*, although the size of the field for *Tor Duduk* is same as *Tok Harimau, due* to the different way the games were played. Whereas, the players were already a distance away from the chasing opposing team player before the game even started as compared to the players in *Tor Harimau* game.

Balance contributes in facilitating the execution of some specific and rigorous action in games and sports (Baker et al., 2007). The findings of the study identified that Buat Rumah Batu has added to the enhancement of balance performance variable. Based on inspection that was carried out, the researchers found that in the game of Buat Rumah Batu game, the body balance is very significant due to the fact that the players have to sustain stability or body position to permit them to jump to each following partition and the challenge in altering the center of gravity of the position and also the strength of the legs to permit them to jump one-legged throughout the game. Thus, to keep body balance in the game Buat Rumah Batu the player must possess the strength and the resilience of leg muscles as well as capable of controlling the position of the centre of gravity or gravity line of the body throughout the game.

Conclusion

The present study discovered that traditional games intervention programme which are *Galah Panjang, Buat Rumah Batu, Tok Harimau,* and *Tor Duduk,* could be efficient in the improvement of motor fitness performance, i.e., agility, reaction time, speed and balance. In fact, each traditional game intervention also showed differences in the effect of each component of motor fitness. Based on these results, it recommended to coaches, physical education teachers and any physical fitness practitioner to apply these traditional games

intervention programmes to increase their motor fitness performance. The tradition could also be revived by allowing children to play every evening as it has been practised initially by the older generation. Another study is recommended to elucidate further the findings discovered in the present preliminary study.

Conflicts of interest - The authors have no conflicts of interest to declare.

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