THE INFLUENCE OF MENTAL IMAGERY TECHNIQUES ON SPORT PERFORMANCE AMONG HOCKEY PLAYERS

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Abstract

Imagery has been defined as "using all the senses to re-create or create an experience in the mind". Imagery has both a cognitive and motivational function. The cognitive function of imagery is the use of mental imagery to experience specific sports skills and to plan strategies in advance for competitions. The motivational function of imagery is the use of imagery to experience goal attainment, effective coping and arousal management requirements. The mental practice literature provides evidence that imagery is an effective cognitive process for enhancing learning and performance of motor skills. The main aim of this study was to correlate the usage of imagery and sports performance among hockey players. Data was collected from 67 hockey players during a match among universities, using Imagery and Sports Performance questionnaire. One way ANOVA showed significant differences on the level of Imagery Usage among categories of hockey players, $F(3, 67) = 14.117$, $p<.01$. Pearson correlation was used to determine the relationship between imagery and sports performance. The results indicated a positive correlation between internal imagery and sports performance, ($r = 0.79$; $p<0.01$), and external imagery and sports performance, ($r = 0.81$; $p<0.01$). Sports psychologists, sports counselors and coaches should use the present findings to recommend imagery to enhance athletes' performance.

Key Word: Imagery, Internal, external, sport performance

Background of the Study

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Imagery has been defined as "using all the senses to re-create or create an experience in the mind" (Cox, 2011). In other words, mental imagery is recalling a memory that stored in the brain into meaningful images. It involve senses such as visual, kinesthetic, auditory, tactile and olfactory. Mental imagery is a cognitive rehearsal in the absence of physical movement to imagine sports performance in the mind. A powerful imagination leads to creation of nerve impulse similar to those generated during real performance. Imagery is the language of the brain. In a real sense, the brain cannot notify the difference between an actual physical event and the vivid imagery of the same event. Therefore, imagery can be used by the brain to provide powerful repetition, elaboration, intensification and preservation of important athletic sequences and skills (Cox, 2011; Ampofo-Boateng, 2009).

The application of mental practice was used for long time and the effectiveness of this technique was proven to enhance athletes' performance besides reducing their anxiety (Mousavi & Meshkini, 2011). Many researches had proved that imagery has a great tendency to improve performance, reduce anxiety, enhance concentration and self-confidence (Cox, 2011; Doussoulin & Rehbein, 2011; Mousavi & Meshkini, 2011; Ampofo-Boateng, 2009). Imagery is the most common technique used in improving the performance of athletes in competitive situations.

Mental Imagery can be divided into two types namely, internal imagery and external imagery (Ampofo-Boateng, 2009). Internal imagery means the athletes visualize themselves as doing the task while, external imagery means the athletes visualize themselves from a third-person's perspectives. In other words, the situation of visualizing the tournaments in your mind, can be called as internal imagery. While external imagery is when the athletes watch the other opponent in the match or they use video clips to see the tournaments. According to Ranganathan, Siemionow, Liu, Sahgal and Yue (2004), external imagery produces little physiological responses as internal imagery does and, thus, it is not effective in enhancing muscle forces. Therefore, it is important to conduct a research to determine the effect of internal and external imagery on sports performance.

An important finding associated with mental practice is that advanced performers benefit from mental practice to a much greater extent than beginners (Cox, 2011). High skilled athletes use

imagery techniques more frequently than low skilled athletes. Therefore, high skilled athletes perform better in sports than low skilled athletes. However, not much research had done to prove it. Among novice athletes, they rarely used mental imagery techniques and it is more affected in professional player's performances.

Psycho neuromuscular theory posits that imagery results in subliminal neuromuscular patterns are identical to the patterns used during the actual movement. Even though the imagined event does not result in an overt movement of the musculature, but the subliminal efferent commands are sent from the brain to the muscles. Hence, the neuromuscular system is given the opportunity to "practice" a movement pattern without really moving the muscles.

Objective

The aim of this research is to identify the usage of imagery among hockey players. In other words, the rationale for this study is designed to determine the usage of imagery among hockey athletes from different ranking namely national, state, district and university in their sports performance. In addition, this research also aims to identify the effects of different types of mental imageries such as the internal imageries and external imageries on hockey performance. This would lead in identifying the best types of mental practices that is very effective in improving the athletes' performances.

Methods

The players in this study were trained to play for inter-varsity hockey matches. The instrument used for this study comprised of a 25-item Imagery Questionnaire and Sport Performance Scale (SPS). The sample consisted of 67 hockey players, including the national athletes (N=24), state athletes (N=15), district athletes (N=15) and university athletes (N= 13).

Result and Discussion

Respondents' Profile

The respondents' profile described their ranking, ethnic and age. Table 1 shows the overall results of the respondents' profile for 67 hockey players. The overall mean age for these respondents was 21.71 years old. The age of male respondents varied from 19 to 25 years, where the mean age was 22.21 years old. The age of female players ranged from the minimum of 19 to the maximum of 24 years old. The mean age for female respondents was 21.47 years old.

The variable "rank which is gathered through this study is categorized into four levels namely, national, state, district and university. The result showed that 24 respondents had participated at national, whilst 15 respondents participate at state, 15 had participated at district and 13 respondents participated at the university level. Majority of the respondents, were undergraduates for Degree (n=37) and Diploma (n=30) programmes.

Table 1: Respondents' Profile (n=67)

Variables	Frequency	Percentage	Mean	SD
Athletes according to rank				
National	24	35.82		
State	15	22.39		
District	15	22.39		
University	13	19.40		
Programme				
Diploma	37	55.22		
Degree	30	44.78		
Age				
Male			22.21	2.31
Female			21.47	1.17
Overall			21.71	1.59

Cronbach Reliability Coefficients

In this study, Cronbach alpha coefficients were found relatively high, ranging from .82 to .88

(Table 2).

Table 2: Cronbach Reliability Coefficients

Questionnaire	Cronbach's Alpha (n=67)
Imageries (Internal and External)	.8888
Sports Performance	.8214

Imagery Items

Imagery item were evaluated External Imagery has the lowest mean ($x\square$ = 13.4127) compared to Internal Imagery ($x\square$ = 17.5411).

Table 3: Imagery Items among Hockey Players

Imagery Items	Mean
Internal Imagery	17.5411
External Imagery	13.4127

4.4 Level of Imagery Usage among Hockey Players from different rank

One way ANOVA showed significant differences on the level of Imagery Usage among hockey players, F (3, 67) = 14.117, p<.01. (Table 4).

Tabel 4 : Level of Imagery Usage among Hockey players from different rank

Atheletes According to Rank	Imagery Usage	
	Mean	Value-F
National	18.5547	14.117*
State	17.0012	
District	15.2455	
University	12.2100	

* p <0.01

Table 5: Pos Hoc Tukey: Level of Imagery Usage among Hockey players from different rank

Atheletes	National	State	District	University	N

According to Rank					
National		*(1.0013)	* (1.4521)	* (2.0441)	24
State			* (1.7884)	* (2.4418)	15
District				* (1.7881)	15
University					13

*p<0.05

The result showed that hockey athletes represented university exhibited lower level of imagery usage than athletes from district, whereas national and state athletes showed the highest levels of imagery usage.

So far, no research done in Malaysia, involving hockey athletes from these four rank. Therefore, this research fails to compare with previous researches completed. However, there are a few research showed that elite athletes uses more imagery techniques. Research of Orlick and Partington (1988) indicated that 99% elite athletes of Canada Olympics used imagery techniques.

Sports Performance of Hockey players from 4 different ranking

One way ANOVA showed significant differences on the rank of sports performance among hockey players, F (3, 67) = 16.146, p<.01. (Table 3).

Tabel 6 : Level of Sport Performance among Hockey players from different rank

Atheletes According to Rank	**Sport Performance**	
	Mean	**Value-F**
National	15.2431	16.146*
State	13.8124	
District	12.0045	
University	10.7891	

* *p* <0.01

Table 7: Pos Hoc Tukey: Level of Self Performance among different ranking of Hockey players

Atheletes	**National**	**State**	**District**	**University**	**N**

According to The Rank					
National		*(1.0046)	* (1.2100)	* (2.9451)	24
State			* (1.3347)	* (2.0014)	15
District				* (1.4787)	15
University					13

*p<0.05

The result showed that hockey athletes from the district rank exhibited lower level of sport performance compared to athletes from the state and university rank, whereas national athletes showed the highest levels of sport performance.

Athletes ranking is one of the most important variables that either facilitate or dampen the performance of the athletes. National and state hockey athletes exhibited higher level of performance with a lot of experience and success in sport, and high level of imagery usage, therefore it is not amazing that they scored the highest for their sport performance.

The types of Imagery and Sport Performance

The correlation coefficient of 0.79 was noted between the usage of Internal Imagery and sport performance in the evaluation of 101 hockey players, which is significant (P < .01). Besides that, positive coefficient of 0.81 was also noted between the usage of External Imagery and sport performance

In other words, the positive relationship existing between these variables is statistically significant (Table 5). Positive correlation indicates that both variables increase or decrease together.

Table 8: The Relationship between Types of Imagery and Sport Performance among Hockey Players

Types of Imageries	**Sports Performance**

Internal Imagery	0.79** (0.000)
External Imagery	0.81** (0.000)

* * p<.01

The result showed that Internal and External Imagery improves sport performance. The research finding completed by Driskell, Carloyn and Moran (1994) supports the use of mental imagery to enhance the sport performance. The result showed that there were significant effects of the mental imagery on sport's performance. Research of Suedfeld and Bruno (1990) and, Lohr and Scogin (1998) showed that the imagery techniques tend to reduce the level of anxiety and this helps to enhance their performances.

Conclusion

The result of this research showed that there is a positive correlation between internal and external imagery with sports performance among hockey players. The usage of all the sensory experiences like visual, kinesthetic, auditory and olfactory using both internal (first person) and external (third person) imagery perspectives to view the images that enhanced sports performance. Many sports such as hockey, not only require physical skills, but also a strong mental game as well.

This study had given a better understanding to the coaches and athletes that mental imagery enhances sport performance of hockey players. Sport psychologists, sport counselors and coaches should use the present findings to recommend imagery strategies to universities and district ranking athletes to increase their level of performance.

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