

Mental Toughness of Malaysia Junior Badminton Players Using Talent Identification Decision Support System

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Abstract: Mental toughness is an important element in modern sports. As an added value, most athletes need mental strength to compete at the highest level. In order to produce future champions, mental strength must be given special attention in the process of establishing their identity as athletes. In badminton, this subject matter must be emphasized because badminton is a sport played either as individuals or in pairs. Therefore, the present study examines the level of mental toughness between junior and elite junior badminton players in Malaysia by using Sports Talent Identification Decision Support System (STIDSS). 14 to 16 years old male athletes (n=40) from the Bukit Jalil Sports School and a few State Sports Schools were involved in this study. The subjects were selected from two categories; 1) elite junior and 2) junior. The integrated questionnaire in STIDSS is used to measure the level of mental toughness (adapted from Goldberg, 2002) and applied to both groups. Descriptive statistics were used to compare the groups on the five-sub construct of mental toughness consisting of rebound ability, pressure, concentration, confidence and motivation. Overall, the results showed 80% of elite junior achieved strength level while the other 20% reached an average level in the mental toughness evaluation. On the other hand, a group of junior athletes achieved 15% in strength level, 65% in an average level and 20% poor level. On all the sub construct of mental toughness dimensions, there were significant differences between elite junior and junior athletes. Elite junior athletes have shown excellent attributes in all the factors, whereas junior athletes indicated average scores. Mental toughness is an important aspect in sports. It can increase self-confidence when confronted with difficult situations when competing. Further training and experiences in competing can help athletes to absorb stress easily in future.

Keywords: mental toughness, sports talent, badminton, decision support system, junior athletes

1. Introduction

Sports psychology is an important element in helping to improve self-confidence and bounce back after facing a difficult situation when competing. In the modern era of competition, the psychological preparation of competing teams is as important as physical preparation and skill. Every team has to balance every aspect effectively to win the competition. Specific skills, physical fitness and mental strength are the best combination for success (Kuan and Roy, 2007).

Mental toughness has been found to be one of the most important determinants of peak athletic performance (Gurmeet et. al., 2013). Subsequently, sports psychologist and coaches have attempted to devise a program for developing mental toughness. The components of mental toughness can potentially vary from sport to sport. Only a few studies have researched the attributes of mental toughness within a single sport by producing variations in mental toughness attributes (Crust, 2007).

In badminton, a match could take a rather long time period and fast game. A good player will go down without a fight and should be able to keep their pace and accuracy of their shots to the last point in the match no matter how long they have played. This is where mental toughness plays a big role. Joseph Singh et. al., (2011) claims many players at development phase are good in the physical and skills aspect, but not enough in mentally. Minna Blomqvist et. al., (2000) state that badminton players should be equally strong in physically and also mentally. Therefore, the present study examines the level of mental toughness between junior and elite junior badminton players in Malaysia by using Sports Talent Identification Decision Support System (STIDSS).

2. Materials and Method

The participants for this study were selected from six sports schools in Malaysia consist of Bukit Jalil Sports School and the other 5 schools were state sports schools from Johor, Malacca, Sabah, Terengganu and Pulau Pinang which has a badminton development program. A total of 40 males (aged between 14 to 16 years) badminton players is involved and has divided into two groups consist of junior and elite junior. Both categories are determined based on two criteria which is a current achievement and a systematic training program besides participation in a competitive tournament at the national level.

A set of questionnaires used to measure the level of mental toughness was adapted from Goldberg (2002) and applied to both groups. The mental toughness questionnaire has 30 items and has divided into five sub constructs consisting of rebound ability, pressure, concentration, confidence and motivation. To ensure the suitability of the questionnaire to the target group, the researchers conducted a pilot test to evaluate a feedback from respondents and to test the validity and reliability of the questionnaire. A pilot test is administered to a group of respondents (n=80) with similar backgrounds to the target groups in the actual study. From pilot study which had been conducted, results show the degree of reliability in high ($\alpha=.761$, $r=.88$) and K value (calculated by following Fleiss' Kappa coefficient) is between 0.81-1.00 was valued by three panels of expert. The mental toughness test score scale is as follows; a score of 26-30 indicates strength in overall mental toughness. Scores of 23-25 indicates average to moderate skill in mental toughness. Scores of 22 and below mean that players need to start putting more time into the mental training area.

The researchers used the Sports Talent Identification Decision Support System (STIDSS) as a tool to facilitate testing. The STIDSS is a web-based application system that could enhance systematic data analysis and data storage. The system able to analyze and test the suitability of the young talents towards specific sports talent base on an evaluation of physical, physiological, psychological and sociological characteristics and in addition, the web-based application solution is a centralized data storage with easy access and secure.

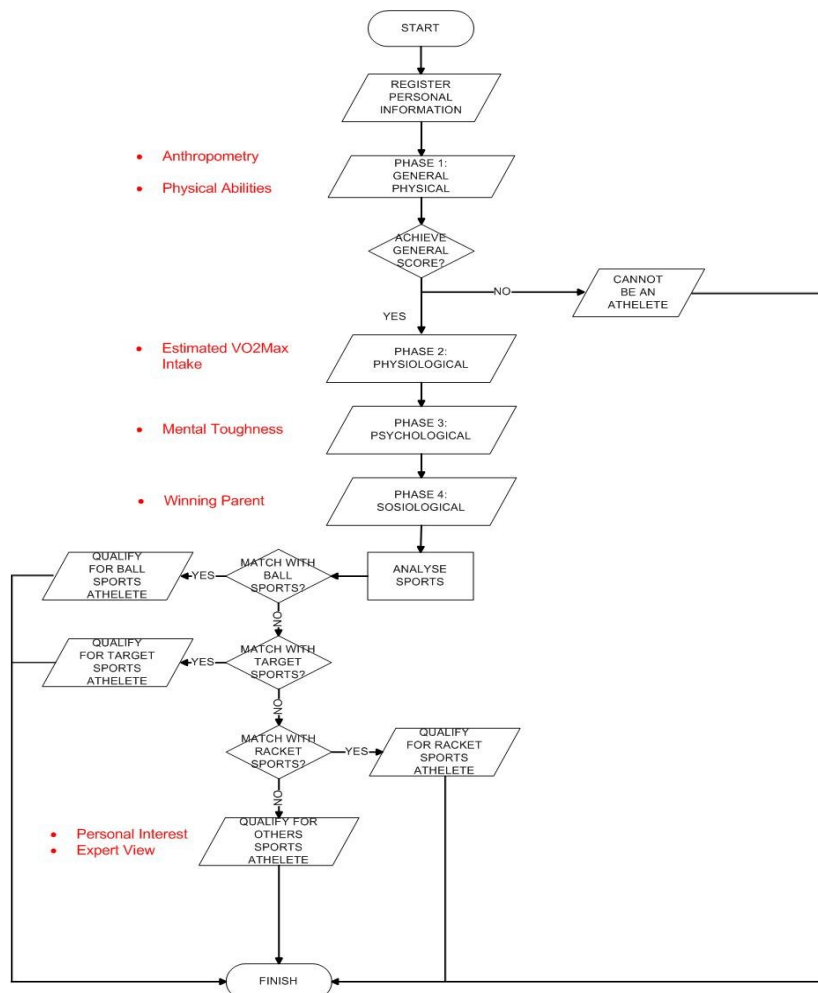


Figure 1. The STIDSS flowchart.

In this study, the STIDSS were allowed the participant to answer each item related to mental toughness measurement and this system immediately analyzed and automatically gives the interpretation based on the results. Every participant’s achievement is recorded and stored in the database.



Figure 2. The STIDISS interface

All participants were comfortably seated in conducive room and given a laptop each to everyone. The instructions were read out to the participants. Supervised self-administration technique was used. There are no time limits for the completion the questionnaire.

To achieve the aims of this study, descriptive statistics were used to show the level of mental toughness for each category and to compare the groups of data on the five-sub construct of mental toughness (rebound ability, pressure, concentration, confidence and motivation), data were analyzed using the Mann-Whitney U in SPSS.

3. Results and Discussion

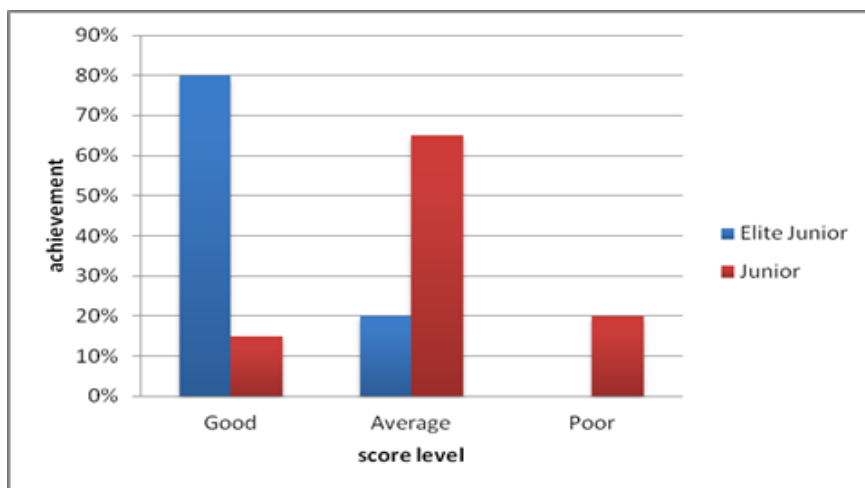


Figure 3. Mental toughness evaluation

Figure 3 showed 80% of elite junior achieved strength level while the other 20% reached an average level in the mental toughness evaluation. On the other hand, a group of junior athletes achieved 15% in strength level, 65% in an average level and 20% poor level. These findings are explained by table 1 shows the mean rank indicates that a group of elite junior has the mental strength better than junior group a whole.

Table 1. Mann-Whitney U Test

		Mann-Whitney U Test				
Sub construct	Group	N = 40	Ranks		Test statistics	
			Mean rank	Sum of ranks	Mann-W U	Asymp. Sig. (2-tailed)
Reboundability	Junior	20	18.25	365.00	175.000	.013
	Elite junior	20	29.75	495.00		
Pressure	Junior	20	17.98	359.50	169.500	.002
	Elite junior	20	27.02	480.50		
Concentration	Junior	20	16.72	364.50	194.500	.010
	Elite junior	20	28.28	465.50		
Confidence	Junior	20	18.18	363.50	163.500	.025
	Elite junior	20	27.88	476.00		
Motivation	Junior	20	16.55	347.00	187.000	.018
	Elite junior	20	29.15	483.00		

*Aged (mean±SD): Junior 15±2.1, Elite Junior 16±0.3[□]

Mann-Whitney U test showed that there are significant differences in mental toughness evaluation between elite junior and junior groups for all sub-constructs [rebound ability (U=175.00, $p<0.05$), pressure (U=169.500, $p<0.05$), concentration (U=194.500, $p<0.05$, confident (U=163.500, $p<0.05$), and motivation (U=187.00, $p<0.05$)]. By comparing the mean rank score between the two groups as shown in table 1 it was found that the mean rank of elite junior higher than junior for all sub-constructs and revealed the elite junior group in this study has a good mental strength compared to junior group.

The both groups are distinguished by different backgrounds. Based on the findings, the experience of competing at the highest level gives good exposure to young players and this factor has been proved by junior elite group in this test of mental toughness. Gucciardi et. al., (2009) state that participated in the regular competitive tournament give players the experience to familiar with the atmosphere of the competition and learn how to absorb the pressure.

Moreover, past experience also has an impact on junior players if the outcome of the match in favor of his opponent and it also interferes with concentration (Connaughton et. al., 2008) and confidence (Ghasemi et. al., 2012). Most of them think about their past poor performance and this effect causes the mistakes during the match. In contrast to the elite junior, most of them are better prepared and have the confidence to compete and this allows them to be not distracted before the match starts. Therefore, Blomquist et. al., (2000) have suggested that a systematic training program and good sparring partner will able to improve their skills and enhance the confidence level. The role of the coaches is also contributing to the success.

4. Conclusion

Mental toughness is an important aspect in sports. It can increase self-confidence when confronted with difficult situations when competing. Further training and experiences in competing can help athletes to absorb stress easily in future. From the findings, most of an elite junior showed a good result in mental toughness evaluation might be because of three factors which is an experience, regularly joining the tournament and have a good training program compare to the junior player have a lack of exposure and a short period of involvement in the systematic training.

5. Recommendation

Sports psychology is a necessary component in producing future champions. The coaches, athletes and sports psychology practitioners have become increasingly interested in discovering the cause and the explanations for why and how to help potential athletes to be at the top performance and efforts vary among individuals. The results of this study yielded some important information to them. Mental toughness evaluation needs to be done from time to time for monitoring the condition of the athletes especially the new talent. Considering the mental toughness can offer a higher success to the athletes, this research would be beneficial for those trying to construct and develop this mental skill.

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