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DIFFERENCES OF ATTACKING SHOTS PERCENTAGE BETWEEN WINNERS AND LOSERS AMONG ELITE LAWN BOWLERS IN SELECTED MATCHES

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Abstract

Lawn Bowls is a game that takes a short time to learn but a lifetime to be an expert and master. This sport requires consistency, accuracy, focus, and precision the aim is to be as close as possible to the jack. The purpose of this study is to compare the differences in attacking shots percentage between winners and losers among world-class lawn bowlers. 14 games were analysed which makes (n=28) data collected for this study. Group one was the winner of the match (n=14) and another group was the loser in the match (n=14). All data for 14 games were collected based on 6 types of shots in lawn bowls. The first type is defending shots (draw and position) while the second type is attacking shots (trail, tap and lie, running and drive). Data analyses were conducted after all the data had been collected. Independent T-tests were used to analyze the attacking shots percentage, defending shots percentage, and total shots percentage which indicates the whole game's performance. Results showed that there were significant differences in attacking shots percentage, defending shots percentage, and total shots percentage between winners and losers among world-class lawn bowlers. Findings show that winners have a higher percentage compared to losers which means that attacking shots thus help a player to win a lawn bowls match.

Keywords: Lawn Bowls, winners, losers

INTRODUCTION

Lawn bowls is a game that maybe takes only short time to learn, but a lifetime to.be expert and master the sport. A sport of precision in which to aim at a small white or yellow ball called jack or kitty that is position between 23m to 37m competing as singles, pairs, triples and fours (Sayers et al., 2015). The bowls in diameter is 115m-130m, has a mass between 1.2kg-1.5kg and has a special characteristic of asymmetrical shaped with a not equal weight between each sides of the bowl which makes the bowl move in an arc being rolled (Sayers, 2019). According to Birse et al., (2022), lawn bowls requires participants to roll an asymmetrical ball (bowl) down a synthetic bowling rink or grass towards small target known as jack and it is a very complex target-based sport. Furthermore, during a match, winner will be determined by points which will be sums up by looking at the amount of bowls in which an

individual or team has inside the closest bowls of the opponent (Sayers et al., 2015). In a simple way to describe how the game to start is, first player must lay the mat and rolls the jack to the other side of the green to make as a target. When the jack has stop moving, the jack will be adjusted to the center of the rink and players will take turns rolling their bowls towards the jack and then the build up the 'head' will occur which refers to clusters of bowls around the jack (Bowls Australia, 2021).

It is very clear that to win a lawn bowls match is to get a bowl closest to the jack or get a bowl closer to the jack compared to your opponent. The most relevant indicator of success in lawn bowls is a player to have a bowl as close as you can to the jack every end. A good performance is based on a player that able to deliver accurate bowls with consistency even when certain conditions is changed whether the player need to change a forehand shot to a backhand shot or vice versa (Birse et al., 2022). Hence, the study on differences in accuracy and consistency in elite lawn bowlers by Birse et al. (2022) and Philips et al (2012 should help in this research. Technically, having the best bowls in draw shot would reasonably boost the probability of becoming a winner in the game. However, attacking shots percentage is something that could be look further into. It is very important to maximize successful attacking shots which could link to becoming the differences whether to become a winner or loser in the game. There are some examples of attacking shots which are trailing the jack, tap and lie shot, running shot and drive shot while for defending shots are draw shot and positional (Wivenhoe Bowls Club, 2020).

In lawn bowls, unfortunately there is still lack of studies done related to the differences of attacking shot percentage between winners and losers among world class lawn bowlers. According to West London Bowling Club, (2018), it is not advisable to use a drive shot and even running shot also should not be engaged in singles game. The same author also mentioned that packing of head is a bad strategy when playing against talented driver. Furthermore, Jack Bunce won a game with his last bowl using attacking shot and this information should help provide better understanding on this study to find out whether there is significant or no significant differences of attacking shots percentage between winners and losers among world class lawn bowlers. Therefore, the purpose of this study was to investigate the differences of attacking shots percentage between winners and losers among world class lawn bowlers whether the attacking shots percentage influence the outcome of becoming a winner or a loser in a lawn bowls match.

METHODOLOGY

Video samples

14 matches were selected and analysed which make a total of 28 subjects in lawn bowls singles competition. Tournaments chosen is only at world level competition which are Commonwealth Games, World Bowls Championship, World Cup Championship. The reason of the chosen 28 subjects is based on past study by Birse et al. (2022 which have 27 subjects and showed there is a significant different on the study and in statistically. In addition, using video samples has been widely used for performance analysis on other sports (Sulaiman et al, 2023).

Procedures

The performance indicators that were recorded and analysed in this study were draw shot, positional shot, trail the jack shot, tap and lie shot, running shot and drive shot. All data were recorded one by one in the frequency table when players perform a shot during the game. For each shot, the following variables were established: For attacking shots, 4 types of shot have been identified. The first one is trailing the jack. It is a type of shot where the deliveries are with sufficient weight to touch the jack and trail to another location at back of the head or straight away to ditch. The next one is tap and lie shot where the aim of this shot is to knock other bowls out of the way delicately enough so that the delivered bowls lies on the spot vacated. Third attacking shot is running shot. The purpose of this shot is to remove the opponent's bowls, to promote own bowls or to disturb the head that is not good. It is a semi drive, which the key is that the weight is under controlled and so that it will allow for bias. Lastly, drive shot. The most spectacular shot in lawn bowls which also the most controversial. Drive shot is targeted

straight at the jack or bowls and then will be delivered with full power or pace to nullify the effect of bias. Opposite to attacking, there must be defending shots. It consists of two types of shot which are draw shot and positional. Draw shot is arguably the most important of bowls shot as you get your bowls as close as possible to the jack which requires correct line and weight while positional refers to any shot which is not intended to the jack, but for tactical considerations either short or behind the jack.

To get the results of this research, this equation that has been used:

1. Attacking shot % = sum of attacking shot / sum of all shot
2. Defending shot % = sum of defending shot / sum of all shot
3. Successful attacking shot % = sum of successful attacking shot / sum of attacking shot

Data Analysis

Descriptive analysis data was analysed using IBM SPSS 26 to find the data such as frequency, means and standard deviations. Independent samples T-test was used to compare the group means (winners and losers) and the significant level was set at $p<0.05$.

RESULTS

The purpose of this study was to compare the differences of attacking shots percentage between winners and losers among world class lawn bowlers and a total of (N=28) lawn bowlers were selected among world class lawn bowlers from selected tournaments. The data has been collected were 6 types of variables which were draw, position, trail, tap and lie, running and drive shots in total of 14 games.

Attacking Shots Percentage

Table1: Mean (SD) of the attacking shots percentage

	Group	N	Mean (SD)
Attacking Shot	Winners	14	61.13
Percentage	Losers	14	37.93

Table 1 shows the mean of attacking shots percentage between winners and losers. The mean of attacking shots percentage for winners (n=14) was 61.13 while attacking shots percentage for losers (n=14) was 37.93. The bar graph of attacking shots percentage of winners and losers were shown in Figure 1.

Table 2: Independent Samples T-test (Attacking shots percentage)

	Group	N	Mean (SD)	t	df	p value
Attacking Shot	Winners	14	61.13	4.598	26	0.001
Percentage	Losers	14	37.93			

Significant: p value < 0.05*

An independent t-test was conducted to measure the attacking shots percentage of winners and losers among world class lawn bowlers. Based on Table 2 shown above, (t = 4.598, df = 26, p = 0.001), there was a significant difference between winners and losers on attacking shots percentage.
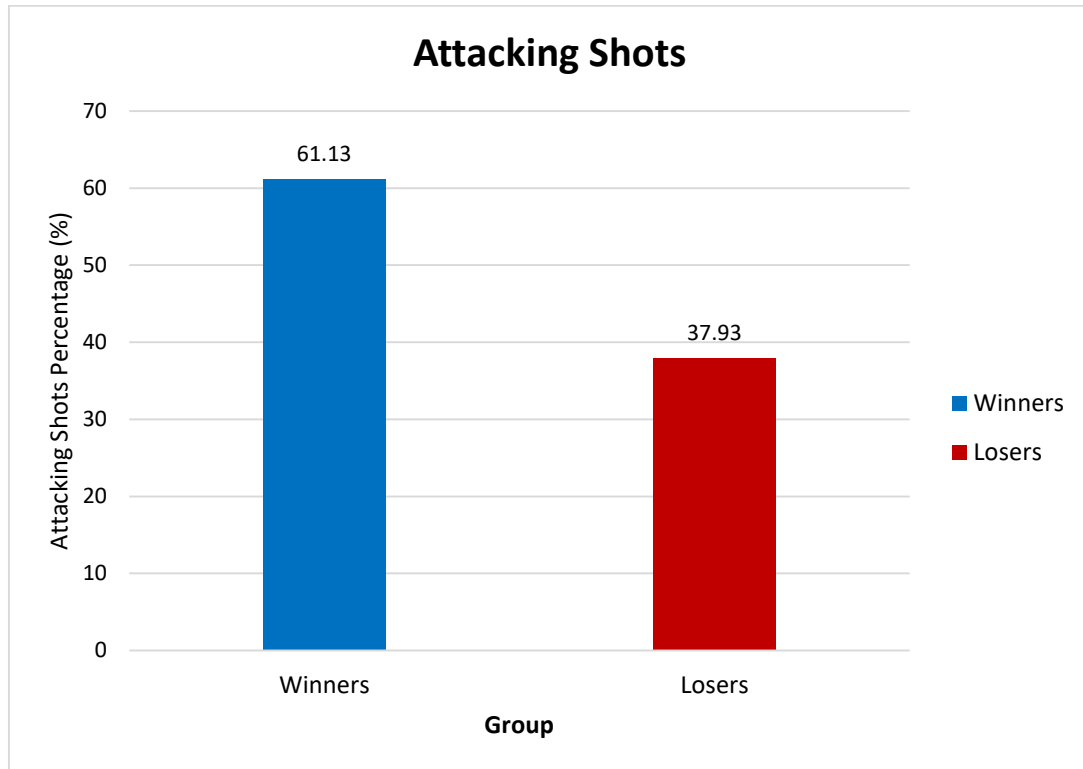
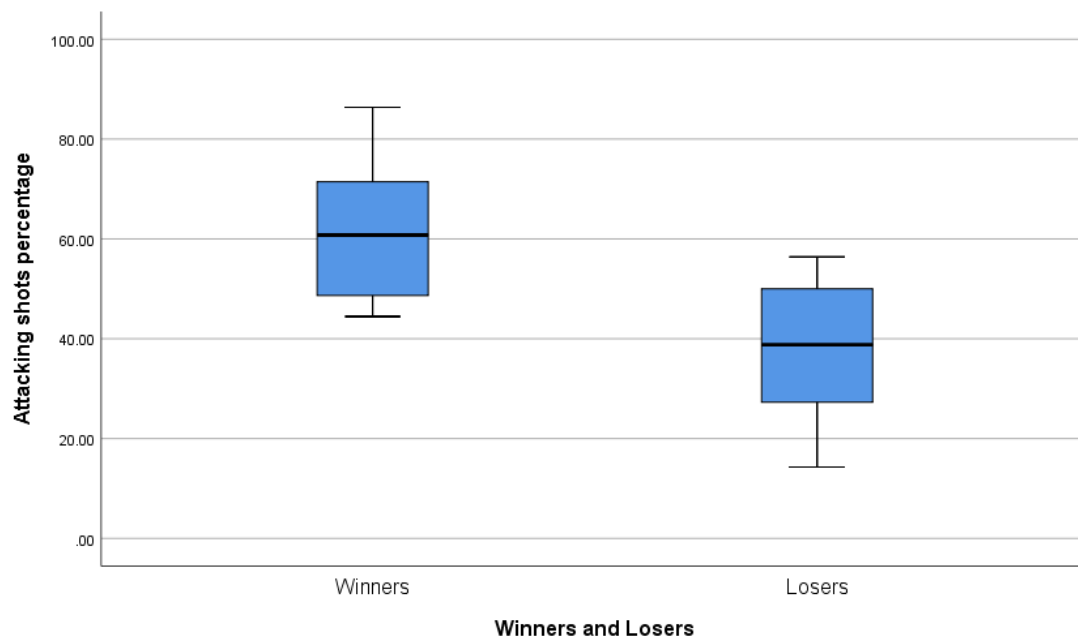**Figure 1** Differences of attacking shots percentage between winners and losers

Figure 2 Mean attacking shots percentage

Defending Shots Percentage

Table 3: Mean (SD) of the defending shots percentage

	Group	N	Mean (SD)
Defending Shot	Winners	14	59.89
Percentage	Losers	14	50.60

Table 3 shows the mean of attacking shots percentage between winners and losers. The mean of attacking shots percentage for winners (n=14) was 59.89 while attacking shots percentage for losers (n=14) was 50.60. The bar graph of defending shots percentage of winners and losers were shown in Figure 2. The defending shots percentage of winners are a bit higher compared to defending shots percentage of losers as illustrated in Figure 2.

Table 4: Independent Samples T-test (Defending shots percentage)

	Group	N	Mean (SD)	t	df	p value
Defending Shot	Winners	14	59.89	2.551	26	0.017
Percentage	Losers	14	50.60			

Significant: p value < 0.05*

An independent t-test was conducted to measure the defending shots percentage of winners and losers among world class lawn bowlers. Based on Table 4 shown above, (t = 2.551, df = 26, p = 0.017), there was a significant difference between winners and losers on defending shots percentage.
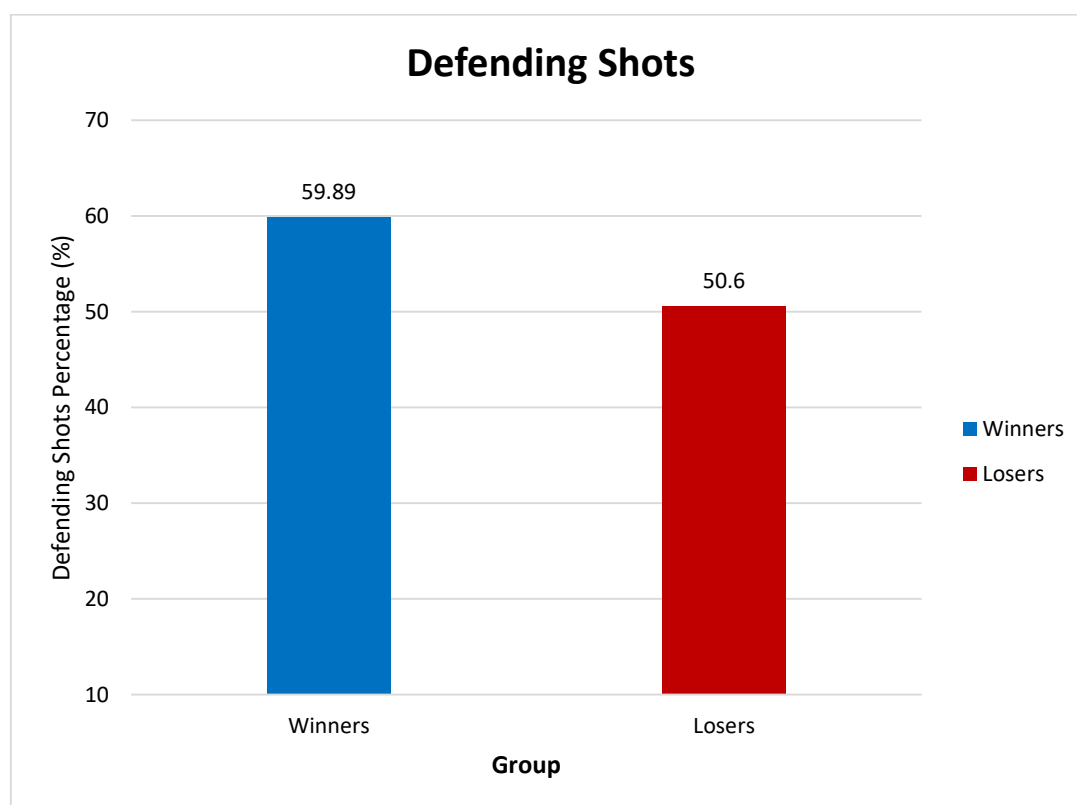

Figure 3: Differences of defending shots percentage between winners and losers
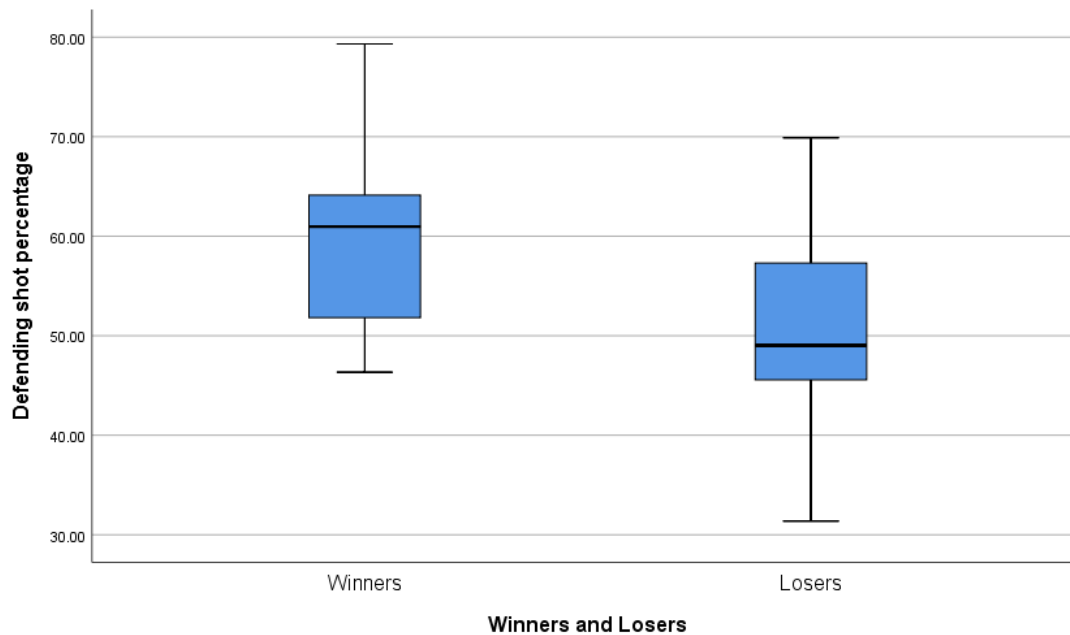
Figure 4: Mean defending shots percentage

Total Shots Percentage (Full Game Performance)

Table 5: Mean (SD) of the total defending and attacking shots percentage

	Group	N	Mean (SD)
Total Shot	Winners	14	60.49
Percentage	Losers	14	48.12

Table 5 shows the mean of attacking shots percentage between winners and losers. The mean of attacking shots percentage for winners (n=14) was 60.49 while attacking shots percentage for losers (n=14) was 48.12. The bar graph of full game performance on attacking and defending shots percentage of winners and losers were shown in Figure 3. The total shots percentage of winners are higher compared to total shots percentage of losers as illustrated in Figure 5 and Figure 6.

Table 6: Independent Samples T-test (Total defending and attacking shots percentage)

	Group	N	Mean (SD)	t	df	p value
Total Shot	Winners	14	60.49	4.019	26	0.001
Percentage	Losers	14	48.12			

Significant: p value < 0.05*

An independent t-test was conducted to measure the total shots percentage of winners and losers among world class lawn bowlers. Based on Table 6 shown above, (t = 4.019, df = 26, p = 0.001), there was a significant difference between winners and losers on total shots percentage.
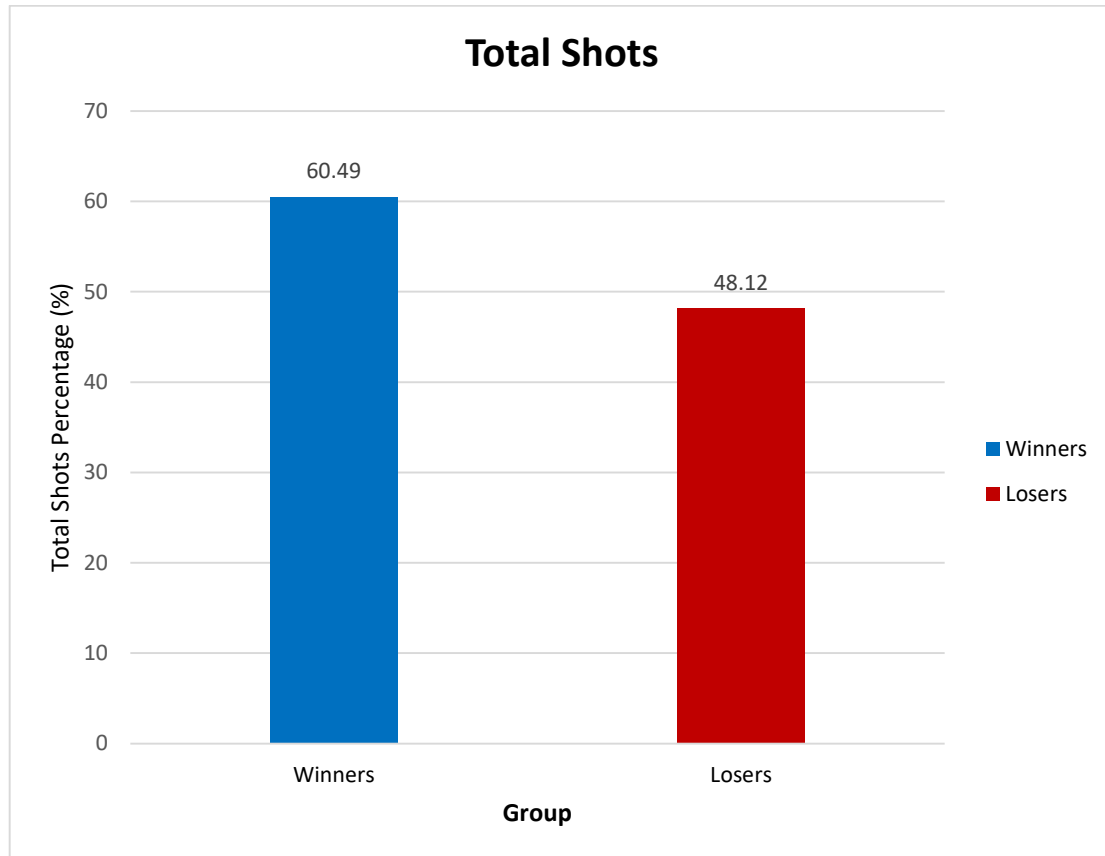
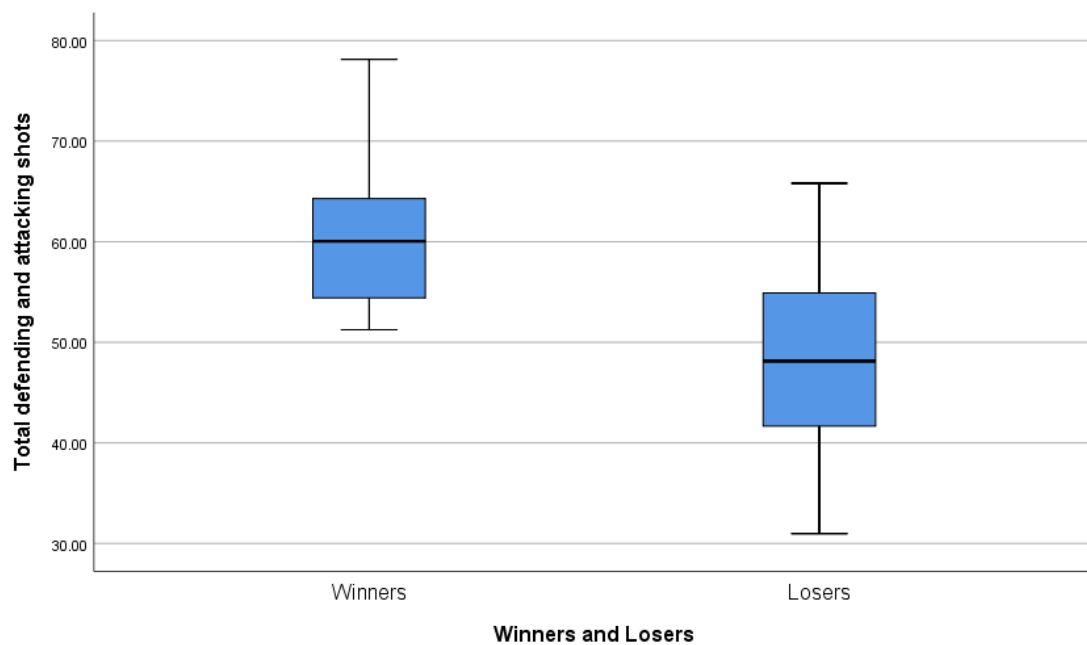**Figure 5:** Differences of total defending and attacking shots percentage between winners and losers

Figure 6: Mean total defending and attacking shots percentage

DISCUSSIONS

Winners have the higher mean of attacking shots percentage compared to losers. This is clearly against West London Bowling Club (2014) which said that it is not advisable to use a drive shot or a running shot in singles games. This study proved that attacking shot thus helps someone becoming a winner in a lawn bowls match. Besides, the mean difference between winners and loser are very big which were 61.13 for winners while losers is 37.93 which means the difference is 23.2 percent and it is quite a huge gap. Furthermore, West London Bowling Club (2014) also mentioned that packing of head is a bad strategy when playing against talented driver which means the player are accurate and have higher percentage in attacking shots. Moreover, Jack Bunce won a game with his last bowl using attacking shot. This statement is very clear proving attacking shots helps Jack Bunce becoming a winner in the game. Therefore, a higher percentage of successful attacking shots clearly influence the outcome becoming a winner in the game.

Winners also had a higher mean in attacking shots percentage (61.13) compared to losers is 37.93, on defending shots percentage, winners had a mean of 59.89 which is slightly higher than losers at 50.60 and total defending and attacking shots percentage (full game performance) also in favour of winner with a mean of 60.49 while losers is 48.12. These results really support that a player with higher successful attacking shots will turn out to become a winner in the game.

To have a higher attacking shots percentage, individual need to get the best outcome when performing the attacking shots. Birse et al., (2022) said that to allow more specific training, improvement in tactical decision making and also enhancing performance, it is recommended to understand how the accuracy and consistency of deliveries changes in any conditions. In addition, there was no different between condition in accuracy, but players are less consistent in forehand delivery. During forehand deliveries, athletes also show a higher displacement in bowling width (Birse et al., 2022). Player with higher consistency and accuracy, will have higher attacking shots percentage that will helps in becoming a winner in that game. Therefore, it is important for a lawn bowler to have higher consistency and accuracy.

Moreover, study by Middleton et al., (2020) compared the pelvis, trunk and upper limbs kinematics of backhand and forehand deliveries in the sport lawn bowls. Backhand deliveries were found to be perform with more upright methods, that might influence weight transmit during the delivery phase. The study also shows that it is similar in upper limb kinematics which suggest coaching training that focus mostly on upper limb can improve both backhand and forehand deliveries. This will help bowlers to have higher attacking shot percentage when their backhand and forehand deliveries improved.

In this study, one of the factors that may have caused the results to have significant difference is accuracy and consistency of the player. Study by Birse et al., (2022) shows that there was no different between conditions in accuracy, but players are less consistent in forehand delivery. Player that has more consistency and accuracy will surely benefits the situation and have that advantage to win the game. It is because the player with less mistakes which will have higher successful attacking shots percentage that will make him or her becoming winner of the match. Loser of the match may have lower attacking shots percentage due to lower accuracy and consistency throughout the entire game. In other words, one with better accuracy and consistency will have better chances of winning the match.

Another role that played part that could influenced the outcome of becoming a winner or loser in a match is their tactical decision making (Abernethy and Cote, 2008) and understanding how the accuracy and consistency changes in any conditions to have higher performance in lawn bowls. For example, there will be situation where the player will have options whether to play defending or attacking on that shot. Maybe that the situation is safe for a draw shot, but a trail shot might be better to secure the head rather than leaving the head too open for opponent which makes opponent easier to counter. Another situation is where the player should already attack the head rather than play a safe or defending shot, but instead the opponent was able to steal the jack by using attacking shot. That will be the turning point where the games will go to which side. Therefore, that player who makes a good decision and have better attention (Araujo, Davids & Hristovski, 2006 and Gottwald, Davies & Owen, 2023) will attack the head before opponent does, thus secure the head and gain advantage during the

game. This will influence the outcome of the game that the more attacking player have slight advantage and more favour to win the match.

This research can help Malaysian Lawn Bowlers to enhance their performance in terms of attacking shots. Therefore, coaches or athletes should concentrate more on attacking play and more drill on attacking shots which are trail, tap and lie, running and drive. By putting more hours or training and drill on attacking shots, surely the accuracy and consistency on attacking shots will improve and thus helps to win a match in big competitions such as World Bowls Championship and Commonwealth Games. This is because other countries such as Australia, New Zealand and Canada are all clearly to have big amount of successful attacking shots which makes them better than their opponent. With higher percentage of successful attacking shots, the athletes will have higher probability of winning a lawn bowls match.

CONCLUSIONS

There are lot of factors that affects a lawn bowler's performance, to name a few are physiological conditions, fitness, delivery technique, experience and decision making. In this study, it is concluded that there were significant differences of attacking shots percentage between winners and losers among world class bowlers. In this case, other factors come into place, where winners may be better in accuracy and consistency, better tactical decision making, more experience in lawn bowls compared to losers in the match.

Recommendations for future research is that it should focused on specific attacking shots percentage which are trail, tap and lie, running and drive shot. Since there are significant differences, research on this should provide more details and will helps bowlers to enhance performance in every match. For example, when there is option to play a draw of trail, player should rather choose trail shot to have better outcome. In addition, future research could also expand the variables of attacking shot and points awarded of successful and unsuccessful to have more accurate results and percentage. This will surely benefit coach and athletes of lawn bowlers to take their game into next level.

REFERENCES

Araújo, D., Davids, K., & Hristovski, R. (2006). The ecological dynamics of decision making in sport. *Psychology of Sport and Exercise*, 7(6), 653-676.

Berry, J., Abernethy, B., & Côté, J. (2008). The contribution of structured activity and deliberate play to the development of expert perceptual and decision-making skill. *Journal of Sport and Exercise Psychology*, 30(6), 685-708.

Birse, S. M., Webster, K. E., Middleton, K. J., & McClelland, J. A. (2022). Differences in accuracy and consistency in elite lawn bowlers. *Journal of Sports Sciences*, 40(11), 1214-1219.

Bowls Australia. Bowls Explained 2020. Retrieved from Bowls Australia website: https://www.bowls.com.au/get-involved/bowls-explained-2/

Bowls International. (2021). Retrieved from Bowls international website: https://bowlsinternational.keypublishing.com/

Bowls Canada. (2010). A brief history of the sport of lawn bowls. Retrieved from: http://www.bowlscanada.com/bowlscanada/myweb.php?hls10098

Bowls International. (2021). Retrieved from Bowls international website: https://bowlsinternational.keypublishing.com/

Gottwald, V., Davies, M., & Owen, R. (2023). Every story has two sides: evaluating information processing and ecological dynamics perspectives of focus of attention in skill acquisition. *Frontiers in Sports and Active Living*, 5, 1176635.

Middleton, K., Webster, K., Birse, S., & Mcclelland, J. (2020). Frontal Plane alignment during forehand and backhand Lawn Bowls deliveries. Paper presented at 38th International Society of Biomechanics in Sport Conference.

Phillips, E., Portus, M., Davids, K., & Renshaw, I. (2012). Performance accuracy and functional variability in elite and developing fast bowlers. *Journal of Science and Medicine in Sport*, 15(2), 182–188. https://doi.org/10.1016/j.jsams.2011.07.006

Sayers, M. G. L. (2019). The influence of bowling velocity on movement variability in experienced older aged lawn bowlers. *Journal of Science and Medicine in Sport / 10.1016/j.jsams.2019.04.005*. https://doi.org/10.1016/j.jsams.2019.04.005

Sayers, M. G. L. et al. (2015). Balance Control during the Delivery Stride in Competitive Older Age Lawn Bowlers. *Journal of Aging and Physical Activity, 23*(1), 34–39. https://doi.org/10.1123/JAPA.2013-0060

Sulaiman, N., Ismail, H., Hasan, H., & Raja Azidin, R. M. F. (2023). A performance of the Malaysia rugby sevens team based on selected performance indicators on a various Asia-level rugby sevens tournament from 2018–2020. *Malaysian Journal of Sport Science and Recreation (MJSSR)*, 19(1), 169-182.

West London Bowling Club. The Next Level-Tactics 2014. Retrieved from West London Bowling Club website: https://www.westlondonbowlingclub.com/?page_id=19

Wivenhoe Bowls Club. Shots in bowls. Various shots that are used in lawn bowls. (2020). Retrieved from wivenhoe bowls club website: https://www.wivenhoebowls.club/bowls-shots/

Zou, Y. (2013). English Newspaper and Sport: The South China Morning Post's Lawn Bowls Reporting in British Colonial Hong Kong. *The International Journal of the History of Sport*, *30*(3), 285–296. https://doi.org/10.1080/09523367.2012.755348