



REVIEW ARTICLE

IMPACT OF THE EIGHT WEEKS TRAINING PLAN ON ENHANCING FOREHAND LOOP STROKE SPEED THROUGH TECHNIQUE CORRECTION IN TABLE TENNIS

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ABSTRACT

The forehand loop is considered to be one of the most important strokes in table tennis since it can dominate rallies through its speed, spin as well as accuracy which is quite crucial in competitive table tennis. However, if the player has technical flaws such as the lack of footwork, inadequate body weight shifting as well as faulty mechanics during the follow-through phase, the speed of the stroke and the whole performance of the player can be considerably below par. This action research aimed to investigate the impact of an 8-week training program that focused on improving the technical aspect of the forehand loop to increase the stroke speed of male table tennis players from Sabaragamuwa University of Sri Lanka. The study was conducted by pre-test and post-test design employing video analysis, feedback sessions and progressive drills for technical faults that were rectified and systematically retested. Basic Level table tennis players were purposively selected during previous tournament where they had obvious technical mistakes. Participants in the exemplar study included analyses of videos and quick tests secured by employing a tennis robot machine for speedy actions and movement quality control. These program's participants understood biomechanical principles and practiced them in increased pace and stroke consistency over three two-week timeframes for 16 sessions. These pre and post-test assessments were analyzed utilizing Human Movement Analyzing software (Kinovea) to examine how quick one is able to move during stroke, and how efficient those moves were. There were statistically significant improvements in both forehand loop speed and accuracy, and the player was able to utilize this refined technique and have even improved performance. These results highlight the importance of biomechanics-focused training and corrective feedback to optimize technical skills in table tennis. This study will be useful, through evidence-based guidance for coaches and athletes, to enable them to focus appropriate training programs that will bring improved performances by players for competitive outcomes. Additionally, these findings are of great benefit to the Department of Sports and Physical Education as support for skill development initiatives for table tennis players.

KEYWORDS

Forehand Loop, Biomechanics, Technical Correction, Stroke Speed Improvement

1. INTRODUCTION

Table tennis is a demanding sport that needs a lot of precision, speed and accuracy. The forehand loop is an important shot in table tennis it is used to attack and it can make a big difference in the game especially during competitions. The forehand loop is a shot that can create a lot of spin and speed which's great for playing against tough opponents. But it is not easy to master it takes a lot of practice and patience. The forehand loop is a movement that starts from the legs then it goes to the torso shoulders, arms and to the wrist. If any part of this movement is not done correctly it can affect the shot. Some common mistakes that players make are footwork not transferring their weight correctly and not following through with the shot. These mistakes can make the shot less effective and less accurate. Research has shown that players need to practice in a way to correct these mistakes.

For example some researchers found that when players practiced with a plan they were able to hit the ball faster and more accurately. This study is about a training program that was designed to help a male table tennis player from Sabaragamuwa University in Sri Lanka improve his forehand loop shot. The program lasted for 8 weeks. It included video analysis, biomechanical principles and drills to help the player correct his mistakes.

The goal of this study was to see if the training program could help the player improve his forehand loop shot speed. The results of this study can be used to help coaches and players design training programs. It can also help the Department of Sports and Physical Education at the university to develop players and win more competitions. Table tennis players need to have technique, speed and reaction time to play well. To achieve this they need to practice their movements and correct any mistakes they are making. This can be done with the help of video analysis and biomechanical principles.

Footwork: players need to move their feet and be in the right position to hit the ball.

Stroke technique: players need to use the technique to hit the ball, including the grip, stance and swing.

Body alignment: players need to keep their body in the position to generate power and speed.

Video analysis is a tool for identifying mistakes and improving technique. It allows coaches to see the players movements in motion and identify areas for improvement. Biomechanics is also important as it helps players understand how to move their bodies in the efficient way possible.

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Force production: players need to generate force to hit the ball.

Analysis: this is the study of the movement of the body.

Stretch-shortening cycle: this is the process of stretching and then shortening the muscles to generate power.

Table tennis is a dynamic and technical sport it requires players to be fast, precise and agile. The forehand loop is an important shot in table tennis it is used to attack and it can make a big difference in the game. But it is not easy to master it takes a lot of practice and patience. The forehand loop is a shot that requires a combination of technique, speed and accuracy. Players who are having trouble with this shot may be making mistakes such as foot positioning, poor weight transfer or not following through with the shot. These mistakes can make the shot less effective and less accurate. To improve the forehand loop shot players can use video analysis and biomechanical evaluation. This can help them identify mistakes and improve their technique. With the help of targeted training programs players can improve their speed and overall game. There have been some developments in table tennis training including specialized plans that focus on correcting technique and increasing speed. These plans use a combination of principles, video analysis and drills to help players improve their game. This research is about a study that was done to see if an 8-week training program could help a male table tennis player from Sabaragamuwa University, in Sri Lanka improve his forehand loop shot speed. The study used a combination of pre- and post-tests, video analysis and systematic training interventions to see if the program was effective. The results of this study can be used to help coaches and players design training programs and improve their game.

2. METHODOLOGY

The purpose of this study was to examine the effect of an 8-weeks training program of table tennis in special preparation and pre-competition period. Firstly, we need to select the research problem so I conducted a past inter university table tennis tournament. Finally selected one player from in Sabaragamuwa University of Sri Lanka. Pre-test and post-test data use to evaluate outcomes. Variables to be assess include table tennis robot test (20 ball test), movement analyze test (video analyze) (International Table Tennis Federation Para Table Tennis Handbook Level 2) (Zhang, 2017). All participants had to relevant skill levels and physical abilities before the study. The treatment player was undergone an 8-weeks special preparation and competition period that includes specific training program designed to improve performance on the measured variables Training program was held on Mondays and Fridays.

Pre-test and post-test – 1) Table Tennis Robot Test

2) Video analyze test

2.1 Pilot Test Procedure

A pilot test was conducted to identify the current status of performance in Forehand Loop Stroke Speed & technique. For this, they played match was conducted to measure the ball speed & lower limb technique of the table tennis Player in Sabaragamuwa University of Sri Lanka. For the test five number of athletes participated of which later the sample was selected. All the instructions to the test were given and a demonstration was provided to the participants. All participants were made sure that they were in good health conditions. All the participants did a warm up session for 12 minutes and all the participants did the same warmup session. It was made sure that the participants did not undergo in any vigorous forms of physical activity prior to the test day and on the test day. The test was conducted under homogenous conditions.

2.2 Pre-Test Procedure

Before the intervention, the entire sample is tested to identify the current level of speed & movement correction. A test to measure ball speed and correct lower limb movements, Pre-test and post-test data use to evaluate outcomes. Variables to be assess include table tennis robot test (20 ball test), movement analyze test (video analyze) & measure speed. The pretest was conducted under the correct guidelines and procedure under homogenous conditions All the participants were in good health condition and it was made sure that the participants did not engage in any form of vigorous physical activity on the day of the Pretest. The pretest station was prepared by 4.30 pm and all the participants were present at the venue by 4.45 pm. player engaged in a regular warm-up session of ten. After gave trail. The test procedure was explained to the participants verbally and one demonstration of the procedure to complete the test was done. The test was conducted successfully.

2.3 Post Test Procedure

The post-test was conducted at the end of the eight-week Training

program. The same test, the “table tennis robot test” & video analyze test was conducted. All the participants did undergo the correct test procedure under homogenous conditions. All the participants were in good health condition and it was confirmed that the participants did not engage in any form of vigorous activity on the day of the post-test. A ten-minute regular warm- up was conducted and it was made sure that all the participants followed the same warm-up session. All the instructions were provided before the test and a demonstration of the test was done. All questions raised by the player was answered verbally, for further clarification a video clip was shared. The purpose of the post-test was to measure the effectiveness of the program after conducting the training for 8 weeks.



Figure 1: Pilot test



Figure 2: pre-test



Figure 3: Post test

3. RESULTS

The primary objective of the program is to find the Impact of the Eight Week Training Plan for Enhancing Forehand Loop Stroke Speed Through Technique Correction in Table Tennis. The tt robot test/ video analyze test was used as a measurement to find the measurement of the strike speed and ball accurate landing. The results of the pretest, and post-test were used as the data for analysis. The study found that the eight-week training

program could improve the performance of the player. By analyzing the results of the eight-week training program it is found that there is a favorable effect of the training program. Before conducting the training sessions, participants was assessed through the pretest. Post-test results are as follows.

Table 1: Comparison motion times Pre Test	
Pre-Test	
Strikes	Entire Phase
1	0.77
2	0.66
3	0.77
4	0.47
5	0.57
6	0.77
7	0.90
8	0.77
9	0.90
10	0.73
MEAN	0.73

Table 2: Comparison motion times Pre test	
Post Test	
Strikes	Entire Phase
1	0.62
2	0.61
3	0.72
4	0.56
5	0.48
6	0.59
7	0.71
8	0.66
9	0.47
10	0.44
MEAN	0.56

Note: BP, backward phase; FP, forward phase; EP, entire phase (BP + FP)/ Unit=seconds

Table 3: Comparison of joint angles in key events (unit: degrees).				
Index		Phase	Mean(degrees) pre test	Mean(degrees) post test
HIP	In the sagittal plane	BP	39.5	52.4
		FP	19.8	11.3
HIP	In the frontal plane	BP	20.4	17.3
		FP	40.0	42.4
KNEE	In the sagittal plane	BP	25.6	26.2
		FP	54.1	63.4
ANKLE	In the sagittal plane	BP	28.6	30.7
		FP	3.1	3.3

Note: BP, backward phase; FP, forward phase

3.1 Improvement in Joint Angle Mechanics

The study found that the players lower body and hip mechanics got better after the training.

3.1.1 Hip Joint

When the player moved backwards the hip angle got bigger it went from

39.5° to 52.4°. This means the player was in a position to start the stroke. The player could store energy and get ready to move forward faster. When the player moved forward the hip angle got smaller it went from 19.8° to 11.3°. This shows that the players hip drive got stronger and the trunk rotated faster towards the ball. The player could move power from the body to the upper body better.

3.1.2 Hip Joint

The hip angle also changed when the player moved sideways. In the phase it went from 20.4° to 17.3° and in the forward phase it went from 40.0° to 42.4°. This means the players balance and control got better. The player could move from side to side efficiently which is important in table tennis.

3.1.3 Knee Joint

The players knee flexion got better when moving forward it went from 54.1° to 63.4°. This means the players lower limb drive got stronger and the push-off mechanics improved. The player could produce upward and forward force, which helps to hit the ball faster.

3.1.4 Ankle Joint

The players ankle angle got better when moving backwards it went from 28.6° to 30.7°. The players foot stability and balance also improved. The player was ready to change direction



Figure 4: speed analyzing & angle analyzing (pretest)

4. DISCUSSION

The study found that the eight-week training program worked well to improve the players forehand loop stroke speed. The players motion times and joint angles got better.

4.1 Motion Times

The players motion time went from 0.73 seconds to 0.56 seconds. This means the players reaction time and stroke execution speed improved. The player moved efficiently.

4.2 Joint Angles

The players joint angles got better during the stroke. The hip angle in the phase got bigger which means the player was in a better position to start the stroke. The hip angle in the phase got smaller which means the players forward movement got stronger and more controlled. The knee and ankle angles also improved, which means the players lower limb engagement got better.

4.3 Training Program

The training program included strength and plyometric exercises. These exercises targeted the players limb and explosive strength. The program worked well even though there were some factors that affected it.

4.4 Comparison to Previous Studies

The studys findings are similar to what Zhang found in 2017. Zhang found that movement correction and strength training can improve performance, in racket sports.

5. CONCLUSION

The eight-week training program improved the players forehand loop stroke speed and movement efficiency. The player moved faster had joint mechanics and was more consistent. The study shows that structured biomechanical correction programs can improve performance in a time. Coaches, athletes and sport science practitioners can use this study to improve table tennis performance.

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