The Impact of 2 Month Online Training Toward Stroke Drive Ability in Table Tennis Players

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ABSTRACT
This study was to get the online training in pandemic Covid-19 to mastery the stroke ability in a table tennis game. Moreover, the concept of table tennis training activities carried out online has never been carried out before the spread of the Covid-19 virus. Therefore, this study presents the concept of training for 2 months that is focused on comprehensively mastering the stroke drive theory. The research method was semi-experimental. Participants were determined randomly. They are young athletes at the Gajah Mada table tennis club in Medan, Sumatra, who have been practising basic table tennis techniques for 6 months. They are around 13-16 years old. The data analysis technique used paired t-test with α = 0.05. The results showed that the ability of stroke drive both forehand drive and backhand drive has increased so that the athletes' table tennis game is very good. The strokes were also perfect. Online training provides a new concept that training activities must be designed according to the needs of athletes and the use of the right technology tools.

Keywords: Backhand, Forehand, Online Training, Stroke Drive, Table Tennis

I. INTRODUCTION
The period of the Covid-19 pandemic has required all human activities in the world must be controlled through restrictions on activities that involve crowds or face to face (Rothan & Byrareddy, 2020). This also has an impact on physical education learning activities and sports in schools or college (Maity, Sahu, & Sen, 2020) and sports activities in various clubs such as the table tennis club in North Sumatra. There are six table tennis clubs in North Sumatra that have stopped face-to-face coaching for stroke drive training for young athletes. In Indonesia, various table tennis coaching for young athletes is conducted online using video calling (Churiyah, Sholikhah, Filianti, & Sakdiyyah, 2020; Mishra, Gupta, & Shree, 2020). The sport changed using digital pattern or technology advance (Sukendro et al., 2020; Iivari, Sharma, & Ventä-Ollkonen, 2020; Subic, Fuss, Clifton, & Chan, 2013). Many studies have proven that the effects of the Covid-19 outbreak limit exercise (Peña et al., 2020), the matches are carried out closed (Bryson, Dolton, Reade, Schreyer, & Singleton, 2021). Management of European soccer is also influenced (Beiderbeck, Frevel, von der Gracht, Schmidt, & Schweitzer, 2021; Hammerschmidt, Durst, Kraus, & Puumalainen, 2021). Training using visual mode has used in volleyball training (Zhou, Chen, & Muggleton, 2020). Physical activity as well as athletes have also decreased (Ariestika & Agung Nanda, 2020).

Currently, the study focuses on the impact of online training on the stroke drive for the young athlete in the table tennis game. The young athletes involved in this study were beginner table tennis players who had just received basic technical training for 6 months. This research is also motivated by the low batting skills of beginners in table tennis for 6 months of practice. It is difficult for beginners to play table tennis. However, the Covid-19 outbreak has stopped training activities carried out at clubs by government policies. Therefore, forehand training activities in playing table tennis are directed using zoom or online training. It means that technological sophistication provides convenience and progress in analyzing table tennis activities, matches, management of table tennis activities or table tennis training.
tennis training at this time. Whereas for young athletes, basic technical mastery of playing table tennis professionally is not easy. The various kinds of exercise teaching methodologies should be varied (Reid, Elliott, & Crespo, 2013a). Stroke in table tennis has an active role in hitting the ball, such as the forehand inside (Martin-Lorente, Campos, & Crespo, 2017). Many media can be used to practice forehand strokes, such as bouncing boards (Hanim & Tomoliyus, 2019), or drill form (Irawadi & Yusuf, 2019).

Previous research has concluded that students prefer face-to-face learning than online (Patricia Aguilera-Hermida, 2020) because online learning has many obstacles such as internet networks or a lack of interaction with teachers (Adnan, 2020). It means that online activities can be successful if the existing challenges and opportunities can be utilized properly (Adedoyin & Soykan, 2020). As in the table tennis technique exercises used films have shown a very good level of basic technique mastery (Dehkordi, 2011). Another tool has used to analyze the ability of table tennis athletes is an IR depth camera to detect and classify the strokes played (Hegazy et al., 2020). In other sports such as basketball, it has proven that the use of multimedia technology makes it easy to do exercises (Wiksten, Spanjer, & LaMaster, 2002; Jinding, 2018; Li & Lu, 2020). Moreover, in the form of 3D animation, it has provided a more interesting sports training simulation process (Dou, 2021). Technological devices related to sports activities can be in the form of the Internet of Things, sports using smart technology equipment, sports applications or systems that can be used for real (Kos, Wei, Tomažič, & Umek, 2018). While in the school has used moodle system (Zou, Liu, & Yang, 2012). It means that currently the sports industry has been influenced by various kinds of technological innovations (Ratten, 2020). Although many studies have proven various technological innovations for sports activities, there are still very few stroke training activities in online table tennis. Therefore, this study aims to investigate the impact of online training conducted for 2 months using the zoom on the stroke drive ability in playing table tennis.

II. MATERIALS AND METHOD

Participants

This research is semi-experimental. Participants are young athletes at the Gajah Mada table tennis club in Medan, North Sumatra, totalling 100 people (male and female). They were selected randomly, then they gave their consent to participate in the study. Because they were also asked to fill out a questionnaire related to the stroke drive exercise in table tennis which was done online. They also have practised table tennis for 6 months. Subjects have provided notes on mastery of basic techniques in playing table tennis. Their age ranged from 13-16 years. The study conducted from October until November 2020.

Measures

Table tennis ability was measured through a pre-test before online theoretical training activities were carried out and after the participants were given online stroke drive theory training for 2 months, they were given a post-test. There are two types of tests designed in the study, namely the theory and practice of playing table tennis. However, the practical test activity was limited and scheduled into 10 groups. Stroke drive capability is measured by forehand drive and backhand drive. The components of the stroke drive ability measurement consist of the position of the body slightly leaning towards the table, the initial stance of the arm movement, the hitting motion, and the final stance of the hand movement.

Procedures

The stroke drives online exercise program has 8 sessions. Training activities are carried out every week on Saturdays starting with 1 week of pre-test activities, 6 weeks of online coaching, and 1 week of post-test. The material given to the participants consisted of theories in making forehand drives and backhand drives using zoom so that interactive activities could go both ways. During the zooming process, the trainer also provided the material with a variety of forehand drive and backhand
drive training videos. Total zoom duration is carried out for 120 minutes. In the interaction process each week, the participants experienced an increased understanding of the concept of doing a stroke drive. During the online training process, it is important to consider the steps for making the forehand drive and backhand drive.

**Statistical Analysis**

Data analysis used a paired t-test with \( \alpha = 0.05 \). Then the data analyzed used Statistical Package for Social Sciences (SPSS) software.

### III. RESULT

The results showed that 2 months of online training was related to theoretical knowledge of stroke drives through measurement of forehand drives and backhand drives. Each variable measuring the stroke drive ability has four components, namely the position of the body slightly leaning towards the table, the initial stance of the arm movement, the hitting motion, and the final stance of the hand movement.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Significance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Position of the body slightly leaning towards the table</td>
<td>1.672</td>
<td>2.858</td>
<td>0.015</td>
</tr>
<tr>
<td>2 The initial stance of the arm movement</td>
<td>1.702</td>
<td>3.529</td>
<td>0.042</td>
</tr>
<tr>
<td>3 The hitting motion</td>
<td>1.543</td>
<td>2.635</td>
<td>0.019</td>
</tr>
<tr>
<td>4 The final stance of the hand movement</td>
<td>1.634</td>
<td>4.278</td>
<td>0.058</td>
</tr>
</tbody>
</table>

The study also showed that 6 months of online training has a positive influence on stroke drive ability especially forehand drive (\( P=0.000 \)) while performing backhand drives has \( P=0.004 \). Also, each indicator of stroke drives significantly impacted the table tennis ability. The athlete has a good position to hit the ball and body position. The result of the pre-test and post-test for the backhand drive can be seen in the below table.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Significance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Position of the body slightly leaning towards the table</td>
<td>1.872</td>
<td>2.752</td>
<td>0.018</td>
</tr>
<tr>
<td>2 The initial stance of the arm movement</td>
<td>1.921</td>
<td>2.935</td>
<td>0.051</td>
</tr>
<tr>
<td>3 The hitting motion</td>
<td>1.682</td>
<td>2.772</td>
<td>0.019</td>
</tr>
<tr>
<td>4 The final stance of the hand movement</td>
<td>1.743</td>
<td>3.557</td>
<td>0.060</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The findings data showed that online training with a zoom was carried out in 6 weeks and 2 weeks for the implementation of tests during the Covid-19 pandemic has had a significant influence on understanding the concept of stroke drive theory, both forehand drive and backhand drive. During the post-test, which is carried out in groups and alternately according to the test schedule, novice athletes show the correct movements. The mistakes that have been made by novice athletes have been resolved by intensive training which focuses on theoretical concepts. Moreover, the forehand and backhand drive has a very important role in mastery of the game of table tennis (Reid, Elliott, & Crespo, 2013b), and this stroke has needed by the young athlete (Pane, Tangkudung, & Sukur, 2019).

However, the findings can provide novelty that comprehensive theoretical concepts taught online either through zoom interactions, giving examples through 3D video simulations, or exemplifying stroke drive errors that table tennis players often do when competing have a positive effect on mastery of each movement for the drive stroke or utilization of smartphone (Lee, Han, Lee, [www.turkjphysiotherrehabil.org](http://www.turkjphysiotherrehabil.org))
& Shin, 2019). Also, the simulation device using video can help the athlete’s comprehending table tennis game (Kornfeind, Baca, & Gastinger, 2012). Moreover, the industrial era 4.0 has provided the concept of implementing education towards reform by involving technology such as flipping tools (Zhao & Kang, 2020). It means that sports training can do using technology device. This research also provides a new concept of training for novice athletes. Every trainer must understand the needs of each age group of athletes (Bastik, Kalkavan, Yamaner, Sahin, & Gullu, 2012) because personality has an important role in sporting success (Allen & Laborde, 2014).

According to their age development, it can be said that the concept of training that involves audiovisuals provides a level of interest and understanding for novice athletes in mastering theory and practice (Basiri, Farsi, Abdoli, & Kavyani, 2020). Before the post-test, the coach gave the game to build an athlete’s self-efficacy, then it increased the backhand skills (Zetou, Vernadakis, Derri, Bebetsos, & Filippou, 2014). They need the self-concept which builds a positive desire in playing table tennis (Thibodeaux & Winsler, 2018). Besides, this study also reveals the fact that the provision of training is focused on mastering theoretical concepts must be improved. Especially during the Covid-19 pandemic, athletes needed high motivation to master the game of table tennis so that their energy could be implemented by the practice of table tennis (Mosoi, 2013; Ednie & Stibor, 2017).

IV. CONCLUSION

In this study, online training aimed at mastering the theory of the basic concepts of stroke drive through the use of various technological devices and internet networks has had a positive impact on mastery of strokes such as forehand drives and backhand drives in table tennis. The results of data processing show the differences in the abilities of young athletes in doing a stroke drive. Therefore, the results of this study have a great impact on enriching the table tennis training model for young athletes. Athletes need a variety of training media that is fun and according to current needs. In the era of technological advancement, it has made it easier to design training activities. It means that training activities using various technological devices do not have to be done for online training, but face-to-face training also still requires technological devices. Moreover, in the world of sports, technology has also been widely used both for the implementation of matches, sports management, or analysis of match results. Meanwhile, the concept of online training has not been widely used, so the results of the research have contributed greatly to the development of multimedia for sports activities or activities.

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