

# Effect of the station training program on agility in youth futsal players

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## ABSTRACT

Agility is a key skill in futsal, where players constantly move and change direction throughout the game. To improve this ability, a high-quality training program is essential. However, a study found that the current futsal training program at Changklang Prachanukul School has not been effective in boosting players' agility. This research aimed to develop and compare the effects of a station training program on the agility of students enrolled in the futsal course. The sample group consisted of 26 students enrolled in the futsal course at Changklang Prachanukul School, selected through simple random sampling, and divided into two groups of 13 students each. The experimental group was trained using the station training program, which the researcher created, while the control group followed the regular training program for 8 weeks, three days a week (Monday, Wednesday and Friday). The Illinois Agility Test was used to assess agility. For data analysis, the Mann-Whitney U-test was used to compare mean agility scores between groups pre-test and post-test, and the Wilcoxon Matched-Pairs Signed-Rank Test was used to compare mean agility scores within each group before and after training. The results revealed that the station training program was of high quality and appropriate. Moreover, after 8 weeks of training, both the experimental and control groups demonstrated significantly improved agility compared to their pre-training levels. In addition, the experimental group demonstrated significantly greater agility than the control group at the  $P < 0.05$  level of statistical significance. These findings serve as a guideline for developing fundamental physical fitness in futsal players and can benefit athletes, coaches, and individuals interested in futsal in the future.

**Keywords:** Futsal, agility, the station training program.

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## INTRODUCTION

Futsal is a sport similar to football, but it has slight differences in terms of field size, number of players, and rules. Also known as 5-a-side football, futsal is currently very popular and has been recognized by the International Football Federation (FIFA). Futsal is a highly demanding and continuous sport, requiring athletes to run at high speeds and intensities for several consecutive rounds with short rest periods. Therefore, athletes need to possess exceptional agility and dexterity. Training in these areas is essential to enhance competitive performance (Naser, Ali and Macadam, 2017). Futsal has recently gained popularity in Thailand, with gameplay similar to football. However, it is played indoors with a smaller team of five players. The rules are simple, requiring a limited playing

area, and it is suitable for all ages. As a result, Thai people often see futsal in various locations, including physical education centers and under expressways, despite it being played on a much smaller field than football. Futsal involves quick body movements, dribbling, passing, and jumping, all of which demand significant physical fitness. Therefore, futsal players need to possess strong physical fitness, comparable to that of athletes in other sports (Department of Physical Education, 2011).

In futsal competitions, they need to have strong physical fitness. The style of play involves dribbling, passing, and jumping, which require strength, endurance, speed, agility, and muscle power. A player's physical fitness is crucial for playing futsal effectively. This includes physical abilities

such as muscle strength, flexibility, endurance, agility, and speed. A physically better-prepared player can play more efficiently, leading to improved competition outcomes (Department of Physical Education, 2011). This aligns with Naser, Ali and Macadam (2017), who stated that the success of a futsal match depends on many factors, with physical fitness being one of them. Having complete physical fitness significantly increases a futsal player's chances of success.

Station training involves a series of aerobic and anaerobic exercises that engage all parts of the body. Many athletes utilize this training method to enhance their physical fitness and target specific muscle groups. It is a carefully designed exercise format that enhances key components of fitness, including muscular strength, muscular endurance, flexibility, and agility. These components are developed simultaneously by organizing training stations and rotating through each one. The goal is for each participant to either improve their time or increase their work output within the same period after a certain amount of training. Each station features different exercises designed to develop various parts of the body, depending on the trainer's approach. Station training can increase muscle strength and endurance, as well as improve cardiovascular efficiency. It prompts the body to adapt continually, resulting in a better metabolism (Kiankaeng, 2013).

Based on the physical fitness test results for the 2024 academic year of male students at Chang Klang Prachanukul School, 75 percent of the students performed poorly on the agility test. Additionally, Chang Klang Prachanukul School lacks a training program that can significantly improve agility in futsal players. Agility is essential for these athletes, as futsal involves fundamental movements that require the body to constantly change position and direction, as well as avoid opponents and obstacles. High agility contributes to success in futsal competitions.

Due to the reasons outlined above, the researcher—who serves as both a futsal teacher and coach—was keen to explore methods for improving agility in futsal players using a station training program. This strategy might boost the competitive performance of youth futsal players at Chang Klang Prachanukul School.

## LITERATURE REVIEW

### Agility

Kamutsri (2017) defines agility as the speed to move a short distance with a quick change of direction. It is a form of movement seen in many sports such as football, basketball, rugby, volleyball, badminton, tennis, futsal, and others. These sports consistently incorporate elements of agility into skills or techniques, especially the rhythm of movement needed to change positions, run towards

changing targets, dodge opponents, or receive and play the ball. In line with Kamlangtawee (2017), Petchploynil (2017) defines agility as the body's ability to move quickly and change direction while maintaining balance, by accurately and rapidly shifting the body's position or direction, using muscles suited for the activity. Additionally, Krolo (2020) explains that agility involves moving and changing direction swiftly in response to external stimuli. This quality is recognized as an important component of fitness related to health and is essential in certain professional activities such as military and police work. However, most people consider agility an important conditioning skill in team sports, especially football. Therefore, it can be concluded that agility is a fundamental physical fitness developed through simple movements, such as walking, running, and jumping. It is a type of fitness applicable in daily life, characterized by the ability to move quickly and continuously. It can also be enhanced through combined strength training.

### Agility training

Kamlangtawee (2017) discussed the principles of agility training, focusing on the following components:

1. Muscle coordination: Improving coordination for a specific movement type suitable for the activity.
2. Muscle power: Agility can be improved, but if muscle strength is lacking, controlling inertia will not be optimal. For example, quick movements need strong legs to stop the body or change direction in a lunge, which relies on both strength and speed.
3. Reaction Time: The time it takes for a movement to respond to a stimulus that impacts agility, such as reacting to an opponent's move. In many sports,
4. Flexibility helps improve a full range of motion, which can enhance movement. However, questions remain about whether flexibility directly contributes to agility. While the components of agility mentioned earlier are important for training, it is important to remember that frequent and repetitive training can improve agility and speed, but only when performed at high speeds.

Furthermore, Limsamran (2020) explains the principles of agility training, stating that agility training is similar to speed training. Coaches should develop athletic skills and various abilities simultaneously, resulting in the development of agility and speed during skill execution. Agility training should be performed early in the day to reduce fatigue. Training should be performed at the trainer's maximum capacity or speed, and adequate rest periods should be taken into account between sets. The ideal rest period is 2-3 minutes. Regarding training frequency and intensity, it should be designed to be appropriate at 5-6 times per set and practiced at 1-2 sets. Therefore, it can be concluded that agility training should

start with exercises that are not too difficult and gradually progress to more challenging exercises to develop various physical qualities that work together, namely flexibility, reaction, and muscle power. Agility training should be tailored and executed correctly for each athlete's specific needs, with sufficient rest periods between exercises or before proceeding to the next one.

### Agility test

Currently, many types of agility tests are available. The chosen test must align with the movements of each sport to accurately and precisely measure and evaluate the athlete's fitness for the specific demands. This is crucial for developing the athlete's potential effectively. In futsal, movement involves constant changes in direction. Therefore, when selecting an agility test, it should include multi-directional movements to evaluate better physical fitness related to the sport. The researcher selected the Illinois agility test because it covers a distance of 5-10 meters and features movement patterns such as short straight-line runs, zigzag runs, and shuttle runs.

### Station training

The principles of station training, as defined by Krabuanrat (2014), are essential guidelines that trainees should follow during practice:

1. During training, emphasis should be on building strength, muscular endurance, and improving the circulatory system.
2. Adjust the intensity gradually and consistently, taking into account the suitability of each training phase.
3. Exercises chosen for strength training should be straightforward and not too complicated.
4. Exercises should be done at the same time by multiple participants.
5. The duration of each station should not be too long, as this can lead to muscle fatigue before finishing all stations or the designated training program.
6. Training should be independent and self-guided.
7. Training should be self-initiated and self-led.
8. The intensity can be adjusted independently.
9. The training conditions can be adjusted to suit competition use.
10. The selection or determination of exercises and the transition from one station to another should be considered. Next, the station should be adjusted to fit the specific training for each type of sport.

### Research objectives

1. To develop a station training program that enhances

agility in students enrolled in youth futsal courses at Chang Klang Prachanukul School.

2. Compare the average agility scores within the experimental group using the station-based training program and the control group using the traditional training program before and after training.
3. Compare the mean agility scores between the experimental group using the station-based training program and the control group using the conventional training program after 8 weeks of training.

### Research hypothesis

1. Students enrolled in youth futsal courses using the station training program have average agility scores after training compared to before training.
2. Students enrolled in youth futsal courses with the station-based training program have greater average agility scores than athletes using the traditional training program.

## RESEARCH METHODS

### Population

This research was conducted under the supervision of the Human Research Ethics Committee, Thaksin University, COA No.TSU 2025\_205 REC No.0405. The population included 50 male youth students aged no more than 18 years enrolled in the 2024 academic year for the Futsal subject, which is part of Physical Education, at three secondary schools in Chang Klang District, Nakhon Si Thammarat Province: Chumchon Ban Nawa School, Wat Chandee School, and Chang Klang Prachanukul School.

The sample group in the research consisted of youth students who registered for the 2024 academic year Futsal subject, which is part of the Physical Education course at Chang Klang Prachanukul School. Participants were males aged no more than 18 years, totaling 26 students, selected through simple random sampling by drawing lots. Next, agility tests were conducted to rank the scores from highest to lowest in a zigzag pattern (Balance Design), and the students were divided into two groups of 13 each. Simple random sampling was used again to determine the final groups:

1. The experimental group participated in the researcher-developed station training program. They trained for 8 weeks, three days a week, for one hour each session, on Mondays, Wednesdays, and Fridays, from 4:00 PM to 5:00 PM.
2. The control group was trained using the regular training program. This group will train for a total of 8 weeks, 3 days a week, 1 hour per day, on Mondays, Wednesdays, and Fridays from 4:00 PM to 5:00 PM.

## Research instruments

There are three instruments in this study:

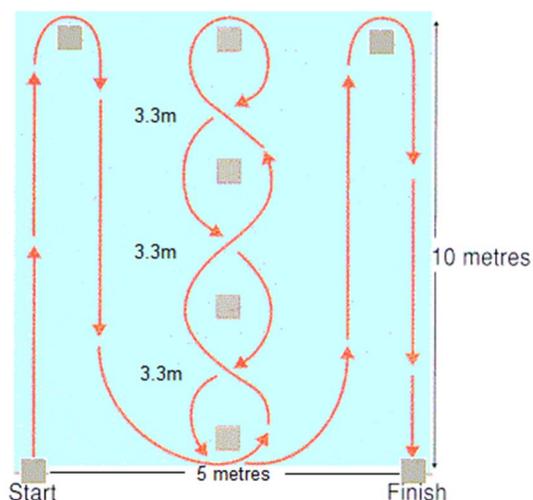
1. The station training program developed by the researcher is as follows:

Day	Step of training	Time (minutes)
	1. Warm Up	10
Mondays, Wednesdays, and Fridays.	2. Station Training Program 2.1. Station 1: S-running 2.2. Station 2: L-running 2.3. Station 3: D-running 2.4. Station 4: M-running 2.5. Station 5: K-running 2.6. Station 6: A-skips. 2.7. Station 7: Jump with both feet 2.8. Station 8: Zigzag jump 2.9. Station 9: Jump over a low fence 2.10. Station 10: Lateral jump over barrier.	40
	3. Cool down	10

2. The regular training program

Day	Step of training	Time (minutes)
	1. Warm Up	10
Mondays, Wednesdays and Fridays	2. Run around the field 3. Passing the ball 4. Shooing 5. Team competition practice	40
	6. Cool down	10

3. The Illinois Agility Test (Mackenzie, 2005)



**Data collection methods**

1. Location and equipment were prepared for data collection.
2. Provide comprehensive training and testing details to research assistants for a precise understanding.
3. Select a sample randomly using simple random sampling (lottery).
4. Agility tests were performed using the Illinois Agility Test among youth students enrolled in the 2024 academic year for the futsal course, which is part of the physical education curriculum at Chang Klang Prachanukul School.
5. The sample was divided into two groups of 13 students each. The experimental group trained using the researcher-developed station-based training program, while the control group trained using a regular training program.
6. Trained over the course of 8 weeks, three days a week, for one hour each session on Monday, Wednesday, and Friday, from 4:00 PM to 5:00 PM.
7. Agility tests were performed after 8 weeks of training using the Illinois Agility Test for both the control and experimental groups.
8. Data obtained from both groups were analyzed for their

intended purpose.

**RESEARCH RESULTS**

Based on Objective 1, to develop a station training program for youth students enrolled in the 2024 school year for the Futsal course, part of the Physical Education curriculum, the researcher conducted a pre-test quality assessment of the instrument as follows:

1. Five experts examined the instrument. The program's suitability was assessed using a 5-point Likert scale, where 5 indicated "most appropriate," 4 indicated "very appropriate," 3 indicated "moderately appropriate," 2 indicated "slightly appropriate," and 1 indicated "not appropriate." The appropriateness score was set at 3.41 or higher (highly appropriate) (Boone and Boone, 2012).

Based on Objective 2, the average agility scores were compared between the experimental group, which used the station training program, and the control group, which used the conventional training program, before and after the training, as shown in Tables 1 and 2.

**Table 1.** Comparison of the mean agility scores pre-test and post-test in the control group.

During training	n	Control group			
		Mean	S.D.	Z	P
Pre-test	13	24.12	1.51	-3.481	.01*
Post-test	13	22.72	1.33		

*P* < .05

Table 1 shows that the average agility score pre-test was 24.12 with a standard deviation of 1.51. Post-test, the average dropped to 22.72 with a standard deviation of 1.33. The p-value for testing the statistical hypothesis was -3.481, and the significance level used to determine the

difference between the two groups was .01 (*P*: .01 < .05). Therefore, the agility of the athletes post-test was better than pre-test in the control group (less time), with statistical significance at the .05 level.

**Table 2.** Comparison of mean agility scores pre-test and post-test within the experimental group.

During training	n	Experimental group			
		Mean	S.D.	Z	P
Pre-test	13	24.14	1.57	-3.181	.01*
Post-test	13	20.24	1.44		

*P* < .05

Table 2 shows that the mean agility score pre-test was 24.14 with a standard deviation of 1.57. Post-test, the mean decreased to 20.24 with a standard deviation of 1.44. The p-value for testing the statistical hypothesis was -3.181, and the significance level used to determine the difference between the two groups was .01 (*P*: .01 < .05). Therefore, the agility of the athletes post-test improved

compared to pre-test in the experimental group (less time), with a statistically significant difference at the .05 level.

According to Research Objective 3, the average agility scores of athletes in the experimental group, who used the station training program, and the control group, who used the conventional training program, were compared before and after 8 weeks of training, as shown in Tables 3 and 4.

**Table 3.** Comparison of the average agility scores between the experimental and control groups pre-test.

Group	n	Mean	S.D.	Z	P
Control group	13	24.12	1.50	-.026	.980
Experimental group	13	24.14	1.57		

$P > .05$

Table 3 shows that the mean agility scores in the control group before training were 24.12 with a standard deviation of 1.50. In contrast, the experimental group had a mean of 24.14 with a standard deviation of 1.57. The p-value for testing the statistical hypothesis was -.026, and the

statistical value used to assess the difference between the two groups was .980. Therefore, the agility scores pre-test between the experimental group and the control group were not significantly different at the .05 level ( $P > .05$ ).

**Table 4.** Comparison of the average agility scores between the experimental and control groups after 8 weeks of training.

Group	n	Mean	S.D.	Z	P
Control group	13	22.72	1.33	-3.488	.01*
Experimental group	13	20.24	1.44		

$P > .05$

Table 4 shows that the mean agility scores post-test in the control group were 22.72 with a standard deviation of 1.33, while the experimental group had a mean of 20.24 with a standard deviation of 1.44. The value for testing the statistical hypothesis was -3.488. The statistical threshold used to determine significance between the two groups was .01 ( $P: .01 < .05$ ). Therefore, the agility scores post-test in the experimental group were better (less time) than those in the control group, with a significant difference at the .05 level.

## DISCUSSION

Results of the research on the effects of a station-based training program on agility in youth futsal players were discussed in accordance with the following research objectives:

1. Based on Research Objective 1, the researcher aimed to develop a station-based training program that enhances the agility of students enrolled in youth futsal courses at Chang Klang Prachanukul School. To evaluate its suitability, five experts used a 5-point Likert scale, where 5 indicated 'extremely suitable', 4 indicated 'very suitable', 3 indicated 'moderately suitable', 2 indicated 'slightly suitable', and 1 indicated 'not suitable'. The appropriateness score was set at 3.41 or higher. This follows Boone and Boone (2012), who indicated that a score of 3.41 or higher is highly suitable and reliable. This means assessment items are of high quality and usable for their intended purpose. The training program was also revised in accordance with expert recommendations. Next, the program was piloted with athletes who did not join the

main program. This helped identify shortcomings and obstacles to ensure completeness before use with the sample group. According to DeVellis (2016), Taherdoost (2016) and Babbie (2020), the try-out process enhances tools or research processes by improving validity, reliability, content appropriateness, and reducing errors prior to actual use. The station-based training program developed by the researchers can be delivered effectively. As a result, trainees showed improved agility skills. This demonstrates that an effective training program can help enhance agility.

2. According to research objective 2, the mean agility scores were compared within the experimental group using the station-based training program and the control group using the conventional training program, both before and after training. The results showed that athletes who used the station-based training program had significantly better agility scores after training than before, at a significance level of .05. This demonstrates that, if training intensity is gradually increased or exercises become more difficult, while still following proper training principles, athletes will experience improvements in their basic skills. This aligns with Krabuanrat (2014), who stated that the principle of excessive training intensity requires above-normal effort. The body will develop or change when intensity or workload is increased systematically. The researchers' station-based training program helps develop agility, skills, techniques, and the functioning of different physical systems. Technique training provides a strong foundation, allowing athletes to acquire body movement skills for various situations. Furthermore, this research supports Homklum's (2016) study, which used a practical learning activity set to develop basic football skills in sixth-

grade students. After eight weeks, the practical, skills-focused activities in health and physical education were effective and met or exceeded the defined standards. Satisfaction with the football skills activity set was very high. This also aligns with Thongnak's (2015) study on a basic handball skills training package, which utilized Davies' model. Students who used this package had significantly higher post-test scores than pre-test scores at the .01 level. This suggests that well-designed basic skills training programs improve student and athlete abilities.

However, even though the control group did not receive proper, appropriate training, their agility test scores also improved after eight weeks. This may be due to increased regular body activity and skill training, which can also contribute to agility development. Although the control group's average agility scores did not match those of the experimental group, this finding is consistent with Thani (2020), who also found that movement and activity can improve physical fitness and athletic skills.

### Research recommendations for application

Training with a station training program has been shown to improve agility in youth futsal players. This activity helps develop athletes' abilities, leading to better mobility, enhanced skills, and overall physical strength. Coaches must closely observe athletes' training to ensure mastery of every skill. They should focus on proper body movement before speed, allowing athletes to understand the rhythm of effective and efficient body movements.

### Recommendations for future research

1. The effects of the station training program should be studied in conjunction with other training methods, such as agility ladder training, to study the effects on agility in futsal players.
2. The station training program should be developed, adapted, and tested in sample groups with similar sports, such as football, to better analyze agility.

### Conclusion

The study's results showed that the station-based training program created by the researchers greatly improved agility in youth futsal players. This is because the program was designed using proper training principles, resulting in improved agility among players. This proves that a well-designed, effective training program can greatly enhance agility.

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