

Validity and Reliability of Futsal Skill Test

by Agus Susworo

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Sport Technology Development”*



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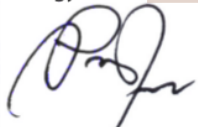
Preface


Salam Olahraga!

Praise and be grateful to the Lord, so that this proceeding can be issued. The **International Seminar of Sport Culture and Achievement** with "Global Issues of Sport Science & Technology Sport Development" theme is **held** on 23rd- 24th April 2014 at Yogyakarta State University Hotel. The seminar is conducted by **Faculty of Sport Science, Yogyakarta State University.**

The seminar was conducted in order to enliven the 50th anniversary of Yogyakarta State University. The Seminar aims at revealing any growing sport potentials and recent worldwide research results. There are three pillars of sport: recreational sports, physical education/ sports pedagogy, and elite sport that in common have one goal to form characters and support achievement.

Hopefully, the publication of this proceeding can bring benefits to the participants in particular and readers in general. Final words for all those who have helped this seminar, we thank you.

55
Dean of Faculty of Sport Science
Yogyakarta State University,

Drs. Rumpis Agus Sudarko, M.S.



Preface

Assalamualaikum WarrahMatullahi Wabarakatuh

The honorable speakers, Prof. Dr. Djoko Pekik Irianto, M.Kes. AIFO (Deputy of Achievement Improvement of Sport and Youth Ministry), Dr. Wayne Cotton (Australia), Dr. Jose Vicente Garcia Jimenez (Spain), Dr. Achara Soachalerm (Thailand), Dr. Lim Peng Han (Singapore), and Dr. Gunathevan A/L Elmulai (Malaysia). The distinguished guests.

First of all, on behalf of the committee of the International Seminar of Sport Culture and Achievement, let me express great thank to God Allah SWT who gives us opportunity and health, so that we can join the international seminar on sport culture and achievement. It is my pleasure to welcome you to the International Seminar of Sport Culture and Achievement in Faculty of Sport Science Yogyakarta State University.

The international seminar is in order to celebrate the 50th anniversary of Yogyakarta State University. In this opportunity, we invite five speakers from five countries; they are from Spain, Australia, Thailand, Singapore, and Malaysia. The participants of the seminar are 250 participants.

Finally, allow me to express my gratitude to all audiences, especially the honorable speakers and the distinguished guests for paying attention to this seminar. I hope that the seminar will run well and be successful.

Thank you very much.

Wassalamualaikum Warrahmatullahi Wabarakatuh

Yogyakarta, 24th April 2014

Chairman of ISSCA,



Dr. Panggung Sutapa, M.S.

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VALIDITY AND RELIABILITY OF FUTSAL SKILL TEST

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Abstract

The aim of this study was to assess the criterion validity and the test-retest reliability of the Futsal Skill Test (FST). Twelve male futsal players and 12 female players from university futsal teams volunteered to participate in this study. The FST requires players to pass, control, dribble, and shoot the ball as quickly as possible whilst making the fewest mistakes. Participants completed the main trials on the same day. All trials were performed inside a futsal court, using futsal balls, and following a standardised warm-up. Validity of the time taken (.7506 and .6503) and the total performance time (.7786 and .6830) for male and female. Reliability of the time taken (.7895, .7532, and .8866) and the total performance time (.7792, .7404, and .8734) for male, female, and all players. The validity for the time taken and the total performance time were acceptable for male players and questionable for female players. The reliability for the time taken and the total performance time were moderate. The validity and reliability of the FST were lower for female players. In conclusion, the FST are valid and reliable protocols to assess differences in futsal skill performance.

Keywords: skill test, futsal

INTRODUCTION

Futsal is a FIFA regulated five-versus-five indoor football game played on a hard surface court. Futsal is a recent ball team sport with a significant increase in popularity over last years. In this decade, futsal became one of the most attractive team's sports. Futsal has incredibly fast passing, and is the epitome of a team sport that still allows room for individual demonstrations of skill, tricks and feints that are relished by players and spectators like [1]. Futsal is deference than soccer. Every futsal players had more changes to contact with the ball (receiving, passing, dribbling and shooting) because the players was too a little and the pitch was too narrow than soccer. The public was more playing futsal.

Futsal is a team sport. The team sport differs from individual sports in that there is no definitive index of each player's performance. The coach may consider that the individual played well if he/she has contributed to executing the overall game plan [2]. The fundamental principle of futsal is to score more goals than the opposing team. Futsal players cooperate with team member in pursuit of common aims, the principal ones being to score goals for the team when in possession of the ball, and to prevent goals being scored against the team when the opposing players have the ball [3]. Team sports refer to games played between two opposing teams. The players interact directly and concurrently to achieve an objective that involves team members facilitating the movement of the ball or a similar item in accordance with a set of rule. Futsal is a team sport, so it takes the performance of each player to be able to support the team's performance. Performance players have a minimum standard that must be mastered. Every player must have the futsal skills as an indicator the futsal team player. It would appear that skillful performances are crucial to winning futsal matches.

Skill was more than technique. The skill aspect is the where the player has a learnt ability to select and perform the correct technique as determined by demands of the situation [4]. A futsal player might have good patterns of movement but if he/she does not perform the right action at the right time then he/she becomes an almost useless player. Futsal players must be able to demonstrate techniques of controlling, passing, dribbling, and shooting as the circuit is limited by space and time. A farther aid to the coach attempts to get to know the need of the

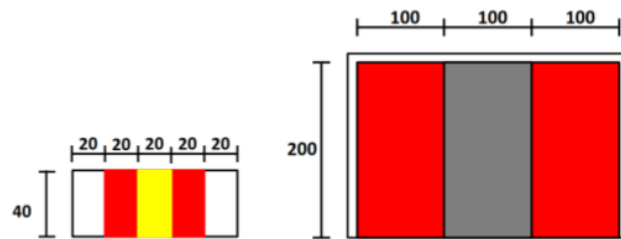


Figure 2. Passing target and shooting target.

Instructions for the futsal skill test

Participant started with the futsal ball by the centre passing area (yellow rectangle). 19: first perform; the participant was doing sequence of passes six times to the coloured target, and the first examiner started timing the test, using a hand-held stopwatch, from the moment the ball was passed at the first time. The second perform; the participant was strike dribbling to the pivot area, than dribbled back to the centre passing area again. The third perform; the participant was required sequence passes six times to the two coloured target by turns. The fourth perform; the participant was required dribbling zig zag to the other pivot area. The fifth perform; the participant are required sequence passes six times to the coloured target at the two passing area (green rectangle) by turns. The final perform; the participant was required shooting into the net (goal) three times, two times with dominant leg and one with the other leg, at the two shooting areas (blue rectangle). If three balls had shot into the net two times with dominant leg and one time with the other leg, the shooting has been completed. But if it has not been able to shoot the three balls was given a chance up to seven balls. If seven balls has not been able into the net, the shoot 34 has also been completed.

The first examiner started timing the test, using a hand-held stopwatch, from the 24 participant was kicked the ball and stopped timing test to the shooting has been completed. The second examiner was to record penalty time points accrued during trials. Penalty time was awarded 1 for the following errors:

- 3 s for handling the ball
- 2 s for missing the goal from shooting
- 1 s for hitting the bar goal from shooting
- .5 s for hitting the middle target goal
- 1 s for shooting the ball from outside of the designated area
- 1 s for the ball touching any cone
- 1 s for the shoes touching 39 cone
- 1 s for the pivot dribbling outside of the designated area
- 0.5 57 or hitting the red target area passing
- 1 s 22 hitting the white target area from passing
- 1 s for passing the ball from outside of the designated area 5
- 1 s for receiving the ball from outside of the designated area

Furthermore, the players were informed that for best performance on the FST they would have to perform the test as quickly as possible whilst making the fewest mistakes. Score test such as time taken and penalty time in performing a series of tasks. Penalty manifested in a sentence with the addition of time, according to the mistakes made. So the total test score is derived from the sum of the time that execution time and penalty time. The score test was the best score of 11 the two trials.

Experiment procedures

The participants completed two mail trials, at the one day. Participants are given the opportunity to try out the protocol of futsal skills test before recording the data. While between

the two trials, participants did not have a chance to practice. A 15-minutes standardized warm-up, consisting of jogging, striding, sprinting, and stretching exercises, preceded the trials.

Statistical analysis

Test-retest is a method of estimating reliability [7]. Pearson's correlation was used to assess reliability between sets of score. The criterion-related approach to test validation involves examining the empirical relationship between score on test and a criterion of interest, typically by use of correlation coefficient [12]. Concurrent validity design studies collect test and criterion score at about the same time. The criterion is player rank at the team as coach's judgment. Every team, male and female, had three coaches. Spearman's rank correlation was used to assess validity between score test and player rank as criterion score. The validity was average Spearman's rank correlations. Median-split analysis was used to assess criterion validity. Cross-validation was performed by calculation of the phi coefficient [10]. Calculating the correlation coefficient used Microsoft Excel 2010 and IBM SPSS Statistics 19. The strength of correlations was based on values derived from Vincent [9], i.e., 0.5 (low), 0.7 (moderate), and 0.9 (strong).

RESEARCH RESULTS AND DISCUSSION

Results

A summary of the FST performance score for male and female players, as well as both groups combined, is presented in Table 1. The actual performance score comprises two variables: the time taken to complete the FST and any accrued penalty time for poor control or inaccurate passing, dribbling and shooting. Trial 2 scores were significantly improved in all but one of the variables thus highlighting a trial order effect.

The result of the median-split table analysis showed that for all components of FST, the majority of the subjects were in the "expected" group (table 2). So for example, for total performance time, 11 out of 12 male players were better than the median score and 11 out of 12 female players were worse than the median score.

There were moderate correlation between trials for the time taken to complete the FST ($r = 0.7532 - 0.8866$ table 1). The correlation for penalty time was low for male and all groups ($r = 0.0400 - 0.2740$) but was moderate for female group ($r = 0.6923$). The correlation for the overall performance for the whole group was moderate but statistically significant ($r = 0.8734$).

Table 1 Mean (\pm SD) FST performance times, correlation (r) between trials and significant (sig.)

Variable	Trial 1 (s)	Trial 2 (s)	R	sig.
Male (n = 12)				
Time taken	57.89 (\pm 10.43)	56.59 (\pm 11.08)	0.7895 *	0.002
Penalty time	12.25 (\pm 5.33)	11.46 (\pm 3.99)	0.0400	0.902
Performance time	70.14 (\pm 14.81)	68.05 (\pm 11.27)	0.7942 *	0.002
Female (n = 12)				
Time taken	83.63 (\pm 13.59)	78.34 (\pm 11.81)	0.7532 *	0.005
Penalty time	13.42 (\pm 5.16)	15.29 (\pm 2.14)	0.6923 **	0.013
Performance time	97.05 (\pm 17.34)	93.64 (\pm 11.78)	0.7404 *	0.006
All (n = 24)				
Time taken	70.76 (\pm 17.70)	67.47 (\pm 15.77)	0.8866 *	0.000
Penalty time	12.83 (\pm 5.17)	13.38 (\pm 3.69)	0.2740	0.195
Performance time	83.59 (\pm 20.92)	80.84 (\pm 17.26)	0.8734 *	0.000

* indicates significant correlation between trials $p < 0.05$; ** indicated significant correlation between trials $p < 0.01$;

Table 2 Median-split table for FST performance between male and female players

		Above median	Below median
Time taken	Male	11	1
	Female	1	11
Penalty time	Male	11	1
	Female	1	11
Performance time	Male	11	1
	Female	1	11

Table 3 Validity FST for all players

		Time taken	Penalty time	Performance time
Trial 1	Male	0.7552 **	0.7972 **	0.8765**
	Female	0.7110 **	0.3112	0.6807*
Trial 2	Male	0.5758*	-0.0385	0.6154*
	Female	0.5734*	0.1037	0.5711*
Best score	Male	0.7506**	0.4044	0.7786**
	Female	0.6503*	0.2762	0.6830*

There correlation between r³⁷ coach judges and score for the time taken to complete the FST were moderate to trial 1 for male and female, and to the best score for male, were low to trial 2 for male and female, and to the best score for female. The correlation for penalty time was moderate to trial 1 for male but were poor to the other. The correlation for the overall performance time were moderate to trial 1 and the best score for male, were low to the other. The agreement between coaches were moderate for all coupled male team coaches, and were strong for female team coach 1 and coach 2, but were moderate for the other. The objectivity of the FST was average the agreement between coaches, for male 0.8461 and female 0.8881 were moderate correlation.

Table 4 Objectivity between coaches

		Coach 1	Coach 2	Coach 3
Coach 1	Male	1	0.8741	0.7762
	Female	1	0,9441	0,8951
Coach 2	Male	0.8741	1	0.8881
	Female	0,9441	1	0,8252
Coach 3	Male	0.7762	0.8881	1
	Female	0,8951	0,8252	1

DISCUSSION

The aim of this study was to valid and reliable the Futsal Skill Test as tool to assess futsal skill for use with male and female players. Male players exhibited better performance score than female players, thus confirming the criterion validity of the test. There was a good degree of reliability for the group as a whole but male players showed more consistent performance, between trials. To be a “good” test, a test ought to have adequate evidence for its validity, reliability, and accuracy for the purpose it is being used for, and for the persons it is being used with [7]. The FST have validity by criterion-related validity and reliability by rest-retest reliability could use to assess futsal skill for male or female players. The variable can be measure by FST were time taken and performance (total) time, so the FST have two form protocol test; just time taken and total performance time. The FST (time taken) had validity

(0.7506 and 0.6503), and reliability (0.7895 and 0.7532) use for male and female. The FST (performance time) had validity (0.7786 and 0.6830) and reliability (0.7942 And 0.7404) use for male and female.

The median-split table was used to examine expected and observed outcomes. For this analysis, all subjects' scores were ranked—in theory, all of the male players would perform better than the median whereas all female players' scores would be below this criterion score. Table 2 shows that 11 out of 12 female players were in the “expected” group whereas 11 out of 12 male players were in the “expected” group. As male players were perceived to have a superior futsal-playing ability and, as this was confirmed by their performance on the FST, this highlights the construct validity of the test. Another approach to validity of criteria-referenced test is decision accuracy that involves decision of cut-off score [10]. Phi coefficient was calculating from the media-split table ($r = 0.9495$). Thus it would appear the FST also has a high degree of criterion validity. The FST could use for both of them with validity (0.9495 and 0.9495) and reliability (0.8866 and 0.8734) by time taken and performance time form.

A test can be valid only if it is reliable, so reliability sets an upper limit for validity [14]. Reliability is more easily obtained than validity, so that the test should have a greater reliability than validity. The FST used to male for time taken and total performance had reliability upper than validity (0.7895 and 0.7942 > 0.7506 and 0.7786). Similarly, for female (0.7532 and 0.7404 > 0.6503 and 0.6830). However, different for male and female, was higher validity than reliability on time taken only and total performance time (0.9495 and 0.9495 > 0.8866 and 0.8734). To present a good supporting evidence for reliability (and thus, validity), a correlation of 0.70 or higher is desirable [11] (Lacy, 2011; 89). Although, the validity of the scale is greater than the reliability, but the evidence of the validity and reliability can be accepted. While the validity of the tests used for female still need to do further study, because it is less than 0.7. This can affect the amount of validity to use for both male and female.

The value of reliability has its own interpretation. The interpreting reliability was based on values of correlation coefficients derived from Barrow and McGee [7], 0.60 (questionable), 0.70 (poor), 0.80 (acceptable), 0.90 (very good), and 0.95 (excellent). Reliability of the FST used to male were poor for time taken only and total performance time and to female too. That deference for reliability the FST used to both male and female was acceptable. Only one method of determining reliability was used in this study for comparison with previous (and future) test and to increase the stringency with which the reliability can be assessed. This reliability can be used by internal consistency or agreement methods.

The value of validity has its own interpretation. The interpreting validity was based on value of correlation coefficients derived from Barrow and McGee [7], 0.60 (questionable), 0.70 (acceptable), 0.80 (very good) and 0.85 (excellent). Validity of the FST used to male were acceptable for time taken only and total performance time but to female were questionable. That deference for validity the FST used to both male and female was excellent. Only one method of determining validity was used in this study for comparison with previous (and future) test and to increase the stringency with which the validity can be assessed. This validity can be used by content validity by expert.

Validity and reliability evidence must be obtained for any new test before the test is used [6]. Test FST can used to assess futsal skill players that had validity and reliability evidence for male and female players. The participant are the students at university, so this test can used to them or the same level players. The validity and reliability of the test cannot be automatically generalized to other populations [11]. Evidence of validity and reliability for male players and female together is higher than for male players or women on their own, so it is still worth doing the assessment and verification of validity and reliability in other subjects, such as students or junior level. Thus it can be seen that the cutoff score of the skills of junior and senior futsal player.

Reliability is the extent to which an instrument consistently measures whatever it measures. There was a trial order effect where players improved performance from trial 1 to trial 2; however, we feel that a few more attempts to habituate participants with the test would

reduce this learning effect in the future. The steps in learning skill were; understanding, practice and performance [13]. At performance's stage, the skill is executed in a match or activity. When executing the skill, players should focus on the purpose of the activity and not the process. When a skill is being performed conscious thought is replaced by automaticity. More mastery players is more automaticity, making it quicker to adapt to the situation.. Trial 2 is more performed than trial 1 on all aspect for male and female, expert on penalty time for female. There is evidence that male players more performed than female players. More power (quickly) is less accuracy [5]. Female players is less performed than male players, so when she added power (quickness), she less accuracy or more error. The results of this study suggest that the more skilful players were able to do this, thus highlighting the validity of the FST.

Scoring is the best time of the two trials [54]. The validity of the test scores are lower than the scores obtained from the trial 1, for all aspects (time taken only, penalty time and performance time)). This does not have to consider how to make use of Anomalies scores, but more on that aspect of punishment that do not have time high validity. Thus the aspect of error in performing skills cannot be a major consideration. The players had good skill made errors caused by psychological factors rather than physical and techniques factors.

Regardless of the type of analysis, the result of this study show that the gross motor aspects of test would appear to be more repeatable. The score for male players were upper than for female players for speed and accuracy aspects but was lower for error aspect. That's indicating that the test were more reliable in both players. Knapp suggested that skill is also synonymous with the minimum outlay of time and energy [15]. Consequently, the more skilful players, they are quicker able to perform the skill test without compromising their ability to make accurate passes, receiving, dribbling and shoot the ball. It is for these reasons that the FST included a dynamic element so that players had to decide upon how best to receive the ball, how to position themselves for the pass and shoot in relation to the targets, and so on.

Finally, the FST have been shown to be valid and reliable methods of assessing futsal skill performance for research use. They appear to be more repeatable for better players who show less variability in their skill performance.

CONCLUSION AND SUGGESTION

The FST was developed to measure futsal skill for male and female players. This test can be used for research purposes and the selection of players. If there is a tiered competition in futsal coaching achievement, then this test can be used as a tool to determine the skill level of players at the level futsal competition everywhere. So the competition can be run more competitive, because every player has a skill impartial.

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