Futsal in Field with Variable Dimensions

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Abstract

This study aims to verify how the variation of game area in futsal game alters the requirement for each athlete. It is an empirical study with transversal characteristics. The sample consisted of six young, male, aged between 16 and 26 years, with experience playing futsal. The independent variable was the square footage of the field per athlete. The dependent variables were the number of contacts with the ball, passing, dribbling/feints, shooting and ball stolen and the number of errors passing, dribbling/feints and shooting and total goals scored. Games were conducted with two teams in 3x3 format players with open goals. The goal was valid if they shots were after the half court. The procedures follow the criterion of game space simulation in accordance with the minimum and maximum of futsal rules in sizes from 80m2, 45m2 and 25m2 for each player dimensions. Whereas the 6 subjects, the games had spaces of 30mx16m, 24mx11m and 17.5mx8.5m respectively, totaling 480m2, 265m2 and 148.7m2. A team made more passes than other by possession. Game actions should always be relativised to have summed and actual results of what happened. The biggest field was no decrease in the shots errors. The percentage of time played was higher in the biggest field, which is more interesting for the fans and the press.

Keywords: Sports, Technique, Training

1. Introduction

Futsal is a sport that has had its rules changed several times in recent years. Since the unification between indoor football and 5-a-side football, its rules accompany the media needs. The playing time, time measurement and, mainly, the spaces on the court were changed.

Piñar et al. [1] (p. 446) tell us: “keeping in mind that competition is an educational setting, and with the aim of increasing and varying player’s type of participation in mini-basketball, a modification of some of rules was proposed.” Thus, we begin to analyze the changes that can be had in sport under a variation of spaces, which is done with small sports games.

Research of Costa [2] with basketball athletes shows us that altering the spaces available to each

player alters their gaming needs. The reduction of the court generates a greater need for actions, both technical and tactical. The pressure of the smaller space forces the athlete to move differently than previously.

In Fontana's study [3], 32 male soccer players were used, being 16 expert players and 16 inexperienced players. The development of decision-making in four exercise intensities was analyzed and then they were invited to answer seven decision-making questions as quickly as possible and as accurately as possible.

The results indicated that exercise does not affect decision-making precision for both expert and inexperienced players, but the decision-making speed of both groups of players improved with increasing intensity of exercise. This suggests that physiological stimulation affects only the speed of decision making, not affecting its precision.

Foresto [4] already used 3x3 games with 63m2 and 6x6 with 100m2 per player to analyze the differences in sports actions. Still, his conclusions on participation are not influenced by the number of players and if by the space of the court. More players are thought to produce less workspace, but in their study there was the opposite.

Other researchers such as Braz and Ré [5] found correlations between the interference of the ball and the number of touches per minute, as well as the shots, which is predictable since there is more pose of the ball, there should be more actions such as touches and shots.

These studies almost always bring us a search for relationships between the athlete's physical and biotipological capabilities with technical and tactical events. Of course, this is a very important line of research, but the path may be reversed. Analyzing the actions resulting from a game on court with different dimensions, you can predetermine what you want for physical, tactical and technical training. In the specific futsal sport, the court settings can make the training have to change everything, as well as the characteristics of the athletes.

This study seeks to know the differences produced by the change in court dimensions, including why there are still many sites that play on narrow and short courts. Thus, this study aims to verify how the variation of playing spaces in futsal alters the playing needs of athletes.

2. Materials and Methods

This is an empirical cross-sectional study, where an independent variable is controlled to verify how it affects other game variables. The sample used was intentional, consisting of six (6) young men, aged between 16 and 26 years, with experience of playing futsal.

The independent variable was the square footage of the field of play per athlete. The dependent variables analyzed were the numbers of ball contact, passing, dribbles / feints, shots and steals, as well as the number of pass, shooting and dribbles / feints errors and the total number of goals scored. .

The instruments used were a futsal court with a wooden floor and variable dimensions. For the analysis, the games were recorded with a Sony brand portable digital camera and later the actions were analyzed using Windows Movie Maker software. Once the actions referring to the dependent variables were identified and categorized, they were compared in the three forms of play.

The procedures followed the simulation criteria of the playing space, in accordance with the minimum and maximum regulatory dimensions of futsal, in the sizes of 80m2, 45m2 and 25m2 for each player. Considering the 6 subjects, the games had spaces of 30mx16m, 24mx11m and 17.5mx8.5m, totaling respectively 480m2, 265m2 and 148.7m2.

Games were held with two teams in 3x3 players, now called team "UF" and "CO", with open goals where it was a valid goal if the shots were after midfield. To start, a time of 3 minutes was observed for the subjects to be acclimated to the rules and spaces and then until the first ball was out after 5 minutes in each game in each court size, all recorded on video. The games followed the increasing order of spaces from least to greatest and in the end more than once the smallest space.

The data was recorded in a Microsoft Office Excel spreadsheet and presented descriptively, counting the number of actions, as well as relativizing the actions for the time played. Then the correct and wrong actions were considered, compared in the games in small court (pqn), large (grd) and once more small (pqn2). The game in the medium court was not considered because the objective of the study is to understand what happens at the extremes of the size of the court.

3. Results

Once the three games have been performed and the times have been arranged in each one, the total times played in seconds for the “small”, “large” and “small 2” games are presented in Table 1. The total time was variable as it seemed better to use the criterion of taking the game to the first ball out of play after the minimum time of five minutes. Thus, the times recorded are not the same, the total time in which the ball was in play was still recorded and thus it is perceived that the game "grd" the percentage was 70.89%, higher than the two games "Pqn" that had 60.06% and 53.65% of the total time with the ball in play.

TABLE 1: Total playing time, ball play time and percentages in the three games.

	pqn	**grd**	**pqn2**
Total Time	313	316	356
Ball in game	188	224	191
%	60.06%	70.89%	53.65%

Table 2 shows the results of the frequency of playing actions that make up the dependent variables studied by court size and by team. The most frequent actions are the passes and here it is not making a differentiation of play style, but registration. There is a big difference between the number of passes of the two teams in the first game with the UF and CO making 11 and 50 passes respectively. The last game the difference fell for 24 and 30, even though the CO team maintained the highest number of passes.

The other actions presented almost the same frequency in the three games, but the number of missed passes increased for the two teams, going from 2 and 4 to 6 errors for each one.

TABLE 2: Number of team actions per game in the three games.

	pqn		**grd**		**pqn2**	
	UF	**CO**	**UF**	**CO**	**UF**	**CO**
Pass	11	50	27	39	24	30
Shooting	6	5	5	4	7	6
Dribble/feint	5	2	3	2	2	3
Stolen ball	2	0	3	4	2	1
Pass errors	2	4	2	3	6	6
Shoting errors	4	3	2	0	2	4
Dribble/feint errors	1	0	2	1	1	1
Goals	2	2	3	4	6	2

After presenting the shares in absolute numbers, Table 3 shows the shares in relative numbers. The stock values were divided by the time each of the teams held the ball in their pose in each of the games. Thus, it is possible to perceive that the CO team made more passes in the time in which they had the ball pose than the UF team in the three games, reaching 0.266 passes per second in the first game as the UF team made 0.035 passes per second.

Another individual result that seems important is that the CO team's shooting errors in the “pqn” and “pqn2” games were 0.016 and 0.021 per second, which in the “grd” game did not exceed 0.000 errors per second. In addition, the CO team achieved ball steal values of 0.018 in the "grd" game, while in the other games it was 0.000 and 0.005 steals per second of ball possession. These seem to be the most important information in this presentation table.

TABLE 3: Relationship between number of actions and total playing time per team in the three games.

	pqn		**gad**		**pqn2**	
	UF	**CO**	**UF**	**CO**	**UF**	**CO**
Pass	0,035	0,266	0,085	0,174	0,067	0,157
Shooting	0,019	0,027	0,016	0,018	0,020	0,031
Dribble/feint	0,016	0,011	0,009	0,009	0,006	0,016
Stolen ball	0,006	0,000	0,009	0,018	0,006	0,005
Pass errors	0,006	0,021	0,006	0,013	0,017	0,031
Shoting errors	0,013	0,016	0,006	0,000	0,006	0,021
Dribble/feint errors	0,003	0,000	0,006	0,004	0,003	0,005
Goals	0,006	0,011	0,009	0,018	0,017	0,010

With the data presented in a relativized way, the sum of the actions of the two teams was made and divided by the total time of the ball in play. Figure 1 shows the relationships of the actions that we judge to be positive in the game, such as shooting (chute), dribble / feint (drible) and stolen ball (roubada). A graphical comparison was made to verify the curves that the actions made. Differences in the three actions are visually perceived, considering the size of the court. On the “grd” court there were fewer shots and

dribbles / feints and a greater number of stolen balls than on the “pqn” court. That is, what happened on the “pqn” court changed for the “grd” court and happened again on the “pqn2” court.

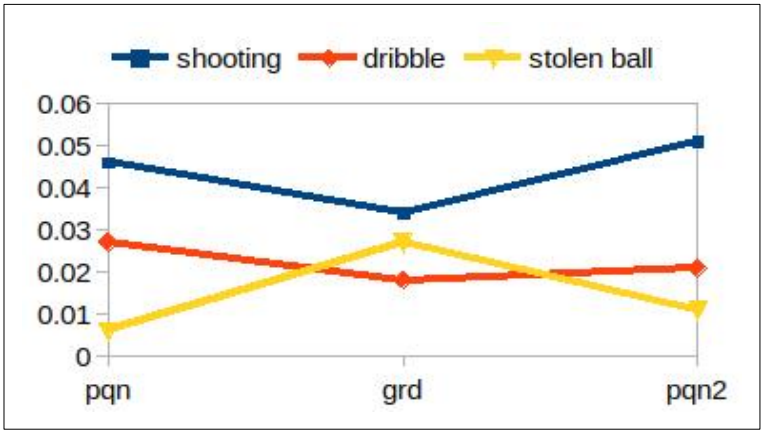

FIGURE 1: Sum of the relative values of the shooting, dribble / feint and ball stolen actions of the two teams by ball time in play.

Figure 2 shows the actions that are supposed to be bad for a team, as follows: dribble / feint errors (dribble errors), passing errors (erros de passe) and shooting errors (chipping errors). Here you can identify the same curves for all three types of games. What happened in the game "pqn" changed in the game "grd" and happened again in the game "pqn2".

What is more evident are the shooting errors that presented results greater than four times on the small courts, with 0.029 and 0.027 as for the large court it was 0.006 errors per second of the ball in play.

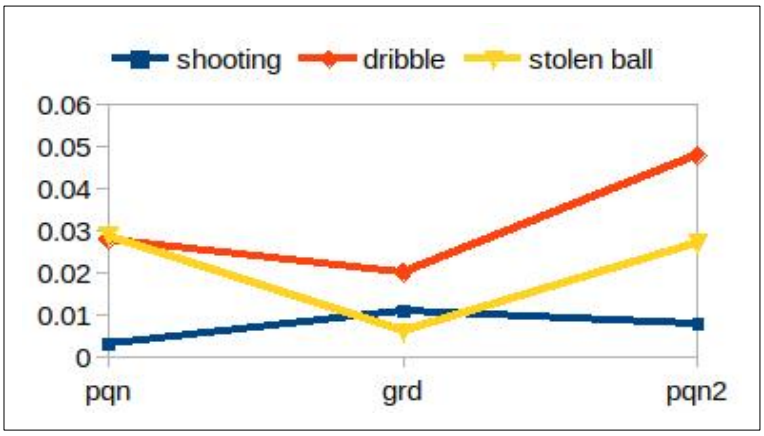

FIGURE 2: Sum of the relative values of shooting error actions, dribble / feint error and pass error of the two teams for ball time in play.

Another variable that was studied and that seems to be very important for the interpretation of the game was the time of the ball in play. Figure 3 shows the percentages of the time the ball was actually being played.

It is perceived that on the “grd” court the ball stayed longer relative to the game with a curve that follows the other variables, where what happens on the small court is different from what happens on the large court.

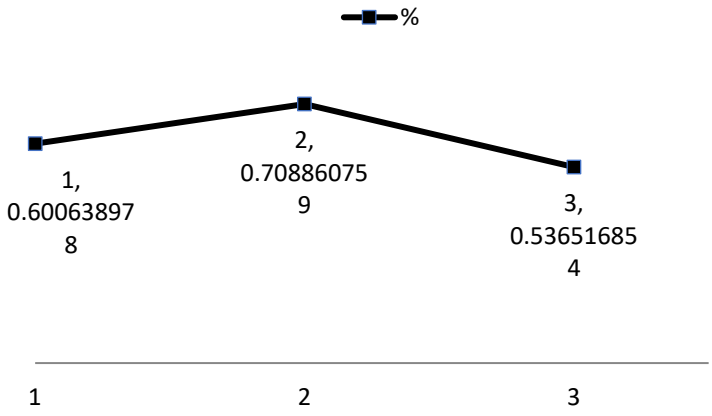

FIGURE 3: Ball percentages in play in the three games, small (1), large (2) and small2 (3).

4. Discussion

To interpret the results in light of recent studies, we will start with the variable of the playing space, or the size of the court. Authors such as Piñar et al. [1] say that the more space decreases, the more offensive actions increase, which cannot be said to have been repeated in our study, even because the expression "offensive actions" has many interpretations. The truth is that there were more shooting errors on the small court, which can be interpreted as an increase in actions, still the errors indicate lower quality of play.

Another contribution is that the pose of the ball did not guarantee the result of victories [5] nor the number of passes made by the team, as this is a difference that is related to the style of play that comes from their training school in different countries.

What seems certain is that there is a common census among coaches that changing training court dimensions can offer better capacity development. In a study by Serrano et al. [6] (p. 154) It is said that expert coaches prefer inexperienced trainers to teach in small spaces or small games and with numerical inferiority. The numerical inferiority increases the court spaces and, of course, there is a greater requisition of perceptual abilities, since it is always necessary to change the player to score or leave the score.

When we talk about dimensions and consequences that flow from them, we think about physical capacities. Drews et al. [7] studying the development of schoolchildren who practice volleyball and futsal did not find significant differences in their development for the agility test of the Shuttle Run. This would be very difficult to imagine in two sports as different as those mentioned. The training load could be the reason, because the court and the structure of the game are different.

It seems true to say that with training changes are achieved. Oliveira et al. [8] even say that pre-season training sessions of competitions help to improve heart rate results in physical tests, which is desirable when it comes to sports performance.

Still, Sampaio et al. [9] have studied the changes in effort and will use 12.2m2 and 16.8m2 per player in their 3x3 and 4x4 games in their studies, and they found no differences in heart rate or effort. What happens is that no comparison can be made with our study since the number of square meters per player was 80m2 and 25m2.

Some studies refer to the pose of the ball saying that there is some relationship with the final result.

De Bortoli et al. [10] talk about the game coefficients and found relationships between the number of errors and the total number of shots made by a team as well as the number of contacts with the ball and the number of total errors. This study remains very interesting because it relativises the actions and refers to the volume of the game.

Duarte [11] presents study results in the final of the futsal world championship at stake between Spain and Italy. Their notes indicate that the relationship between passes and time in pose of the ball remained like this, respectively between the teams of 0.348 and 0.198, which can be perceived that each player from Spain stayed a shorter time with the ball at his feet, not reproducing what happened with the change of court size in our study.

A criticism of Duarte [11] (p. 79) to the studies carried out is that "... the analyzes have been carried out, essentially, by registering the frequency of individual technical-tactical actions", a limitation that was attempted not to proceed.

From a technical point of view, the aging of the players must be taken into account, since our sample was of young people. Araújo et al. [12] say that the older the age, the greater the hardness in the hips. Considering that, the technique in futsal changes with age, since the actions are done with the feet and the motor and balance command follows a support route through the hips and the need to move on the court can add different physical requirements for execution of technique.

In a comparison between soccer and futsal, Barbieri & Gobbi [13] say that futsal has a more intense dynamic, which means that players act across the field. This could be said to be the consequence of the spaces per player being less than in soccer. With the lengthening of futsal courts, the spaces are greater, decreasing their intensity when compared to small courts.

Still, the same Barbieri and Gobbi [13] (p. 43) say that "...to reach proficiency not soccer and not futsal and indispensable similar performance between the two sides." You can look for examples in contemporary football that do not confirm this statement. There are good players who are proficient with both feet or ambidextrous techniques.

5. Conclusions

This study sought to know the differences produced by the change in the dimensions of the court and the objective was to verify how the variation of playing spaces in futsal alters the playing needs of each athlete. The results, even if they are not definitive, guarantee us some well-placed conclusions and some lines for future studies.

One team made more passes than the other due to ball possession time, which is believed to be due to the style of play adopted. The game actions must always be added and relativized to have real results of what happened. On the large court there was a decrease in shooting errors. The percentage of time played was higher on the big court, which is more interesting for the fans and the press.

It was also worth saying that there were no significant differences, there was a visual difference in the variables when we changed the size of the court. Perhaps this factor is due to the small sample and time played, which invites us to propose longer studies for possible verification of these data.

6. Acknowledgments

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7. Conflicts of Interest

The authors declare no conflict of interest.

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