Small-sided games for technical and tactical development in young rink hockey players

Abstract. Rink hockey like any other team sport game is necessary to have a mastery of the game object «the ball» and for this it is necessary that athletes do not have a deficient training steps in that process, because it is during their development, that the athlete is in an optimal situation to improve on this aspect of the game. The study objective was to identify which game model allows young athletes to have a greater number of interactions with the ball in rink hockey in the levels of «Under 8» and «Under 10». Our study sample consisted of 24 games: 8 games in the 3x3 model; 8 games in the 4x4 model and 8 games in the 5x5 model. The 24 matches are equally divided by the levels of Under 8 and Under 10 with a total of 88 children participating. For data collection instrument we used the deferred observation method where we proceeded to a descriptive analysis of the data to find the means, standard deviation and totals of: Shots, Passes, Interceptions and Goals. The Mann-Whitney and Kruskal-Wallis tests were used for comparisons and for correlations, the Spearman’s Test was used to verify whether as the playing area available to the player increased, the player’s actions increased as well. The 3x3 model obtained a total of 911 actions, the 4x4 model obtained 923 and the 5x5 game model obtained 799 game actions. The 4x4 game model obtained the highest total number of game actions in all levels analysed suggesting that the implementation of this model brings benefits to the athletes.

Keywords: Hockey; Small-sided games; Training Levels; Children; Game Models.
stresses that it is necessary to think about these practices with multiple possibilities, attending both to its practitioners, to occupy their free time, and to those who seek it for health issues. It is necessary to work with a sports initiation that allows a conscious practice. According to Gayo (1998), due to the special means of movement, rink hockey is an extremely fast game that involves great players mobility, forcing very quick and perspicacious actions and decisions, given that the game actions are performed in an attack situation, occupied by 8 athletes, where tactical reasoning is a fundamental component to increase performance in this sport.

The main objective of this study is to identify the game model that allows players to obtain a greater number of actions with the ball in rink hockey in the levels of «Under 8» and «Under 10», with specific objectives such as: 1) Knowing which game model guarantees more ball actions for all players; 2) Knowing if there is a relevant discrepancy in terms of game actions in athletes with the different game models; 3) Knowing which type of system guarantees the most finishing situations for each player.

Small-sided games

Small-sided games (SSG) are played, as the name implies, in fields with smaller dimensions and in which a smaller number of players is often used, when compared to a formal (full-sided) game, (Hill-Haas, Dawson, Impellizzeri & Coutts, 2011). Also, according to Hill-Haas et al. (2011), one of the specific characteristics of small-sided games is the specific aerobic work involved. There are some studies (Romero-Caballero & Campos-Vázquez, 2020) that establish comparisons between the Small-sided Team Sports Games (SSTSG) and the traditional aspects of training. Among these, what has been discussed are comparisons with interval training methods (Flores-Rodríguez & Ramírez-Macías, 2020). At the competition level, the SSTSG are increasingly used as an alternative and efficient way for physical preparation, both generically and at intervals, to train movement patterns, physiological intensity and technical execution, so that they are thought through to reflect the competitive game and reduce the training volume (Lopez & Gutiérrez, 2018). However, the realization of these advantages depends on the game model, which requires a good understanding of the variables that influence the prescription of training intensity of the SSG. The number of players is also a factor that can influence the intensity of the SSTSG. To study this variable, the number of players is changed, but the other characteristics remain constant, for example, the dimensions of the field. It is necessary to adapt the game to the child and not force the child to adapt to the adult game (Ferreira, 2013).

Small-sided games benefit children by making their first contacts with the game even more enjoyable and at the same time providing them with an environment that will facilitate further development of their skills (Torreblanca-Martínez, Ojeda & González-Jurado, 2019). Children should be encouraged to maintain ball possession. In games with smaller fields and with a smaller number of players, the receiving and passing actions increase significantly, favouring a transfer of learning to the game situation. Castelo (2003), describes that the most used behaviours are the reception and pass actions. The training exercises for maintaining possession of the ball in smaller playing spaces, consist of a wide range of situations that can be conceptualized, through which one seeks to achieve greater security in maintaining possession of the ball in individual and collective terms, through of the systematic use of the following five factors: Field size, number of players, time, technical and instrumental. He also mentions that the exercises to maintain possession of the ball are established as general means of specific preparation for players and teams (Moniz, Clemente, Praça & Costa, 2021). The exercises are characterized by the possibility of creating conditions that aim at tactical resolutions on the side of safety, that is, there is a collective effort, which prevents from attacking the opposing goal or if
there are no favourable conditions to do so, it is preferable to keep ball possession, instead of taking the risk of «handing it over» to the opponent in an extemporaneous and thoughtless way. According to Rampinini et al. (2007), small-sided games are used by coaches for technical-tactical development and for improving aerobic fitness. Along with the field, there may also be variation in the number of players (Honório, Batista, Santos, Serrano, Petrica, Almeida & Camões, 2021). These games are commonly used as part of structured training for players of all ages and levels. According to Hill-Haas et al. (2011), at the competition level, the SSG increasingly used as an alternative and efficient way for physical preparation, both generically and at intervals, to train movement patterns, physiological intensity and technical execution, so that are designed to reflect competitive play with less training volume (Cussaria et al., 2019; Sousa, Gouveia, Marques, Sarmento, Caldeira, Freitas, Lopes, Prudente & Ihle, 2021). However, the realization of these advantages depends on the game model. This requires a good understanding of the variables that influence the prescription of training intensity of the SSG.

**Rink Hockey (Mini hockey)**

The Portuguese Hockey Federation (2014) identifies Rink hockey as an excellent «tool» for the growth, expansion and development of rink hockey, allowing children of both gender from 4 to 8 years old to have their first experience in the practice of this sport, which will open new horizons and opportunities to increase the number of practitioners, which can determine the improvement of their quality and capabilities. Rink hockey is originally the adaptation of the adult game to the needs and characteristics of children (Valente, 2007). According to Honório, Batista, Paulo, Serrano, Martins and Mesquita (2017) Mini hockey promotes greater technical-tactical action in the levels of Under 8 and Under 10, with greater interaction with the ball, thus becoming an excellent stage of teaching-learning for the 5x5 formal game on fields of official dimensions. Therefore, mini hockey is played in a field of smaller dimensions, with lighter balls, adapted hockey sticks to the child’s size, as presented by Simões (2010) and with simplified rules, thus providing children with opportunities to develop their skills. The goal of mini hockey is to promote youth sports by focusing on the formative aspect of sport. Mini Hockey appears as a proposal for a progressive learning of the formal game of hockey (5x5). In addition to improving the technical skills of skating and stick/ball movements, the following notions should be introduced: Simplification of the rules, Modification of the playing field, variation / reduction of opposition and alteration of the specificities of the ball (size and weight of the ball). Graça and Oliveira (1995), consider that in the introduction of the game it is essential to isolate the disturbing factors of the success of the tasks, making it essential to adapt the game conditions such as:

The same authors present their proposal for learning / structuring the rink hockey game situation, which consists in the progressive realization of the following situations:

According to the facts mentioned above, we consider it premature to start approaching the game through the formal 5x5 situation. As Valente (2007) points out, the game for adults should be modified, adapting to the needs of children. Therefore, the introduction of the game should be carried out through situations that gradually increase in difficulty, from simple to more complex situations. However, based on the proposal of the Portuguese Hockey Federation (2014) for a simplified game, in the context of Mini hockey, based on the 3x3 game model, the intention is to analyse the game dynamics in the Under 8 and Under 10 levels, verifying if this adaptation translates into greater contact with the ball by the players and if the game becomes more interactive.

**Methods and Procedures**

**Participants**

The number of participants were 88 athletes, aged between 6 and 10 years old, who practice rink hockey since the age of 5 years. Our sample consisted of a selection of 24 games, from 4 different teams, of two levels, divided into: 8 games in the 3x3 game model; 8 games in the 4x4 game model and 8 games in the 5x5 game model. The 24 games are equally divided between the levels of Under 8 and Under 10 of 4 clubs with a total of 88 participating athletes. The 3x3 and 4x4 games will be played in half-field, measured between the midfield line and the back table, with the game played between the side tables. The 5x5 games are held in the context of a formal game with official dimensions. All levels and athletes included in the study were subject to the same conditions.
**Statistical Procedures**

Before registering the different actions, a measurement was carried out in the observation process. First, the observers defined and learned the behaviours to be evaluated, discussing the categories among themselves, so that after observing the same time interval in a video and the behaviours of the same individual, both agreed (Petrica, 2003). For the inter-observer evaluation, an excerpt from the first 3 minutes of a predefined game was analysed. To know the percentage of agreement between the observers, the Bellack formula presented and described below is used:

\[
\% \text{ of Agreements} = \frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}} \times 100.
\]

Finally, we entered the data in the statistical analysis program SPSS Statistics 20, where the minimum, maximum, mean and standard deviation values are presented. Considering the number of games observed, non-parametric tests were used (Almeida & Freire, 2000). Therefore, we used the Mann-Whitney test to compare two independent samples, the Kruskall-Wallis test to compare three or more independent samples, as well as to test correlations, we applied the Spearman correlation test.

The level of significance used to accept differences between groups and correlations between variables was 0.05, which gives us a guarantee of at least 95% probability.

The reliability of the observation can be attested by the high percentage of registered agreements, which is at least 85%, only with values equal to or greater than that the agreements are acceptable both in the intra-observer and inter-observer modality, as we can see in the following table:

| Observed variable | % Agreements Intra-Observer | % Agreements Inter-Observer |
|-------------------|-----------------------------|----------------------------|
| Shots             | 100%                        | 100%                       |
| Passes            | 92%                         | 92%                        |
| Goals             | 100%                        | 100%                       |
| Tackles           | 100%                        | 85%                        |
| Interceptions     | 100%                        | 85%                        |

The day of the recordings: field size, playing time and number of players. This investigation can also be assumed to be quantitative in nature - quasi-experimental. In this sense, the study was developed by testing hypotheses and relationships between variables (Fortin, 1996). However, at the quasi-experimental level, it is not possible to control some parasitic variables that converge or may converge with the independent variable in explaining the results (Almeida & Freire, 2008).

Thus, the methodological design presents an experimental group, without recourse to an assessed control group, with the same group being assessed in different situations. A convenience sample was used, thus, some variables such as group selection or diversified interaction are properly controlled (Almeida & Freire, 2008).

After acceptance of the proposal by the clubs, we proceed to deliver requests for informed consent to the parents of the players to record the games. We used the filming of several games and then recorded the number of actions by each player divided by total shots, shots on goal, total passes, right passes, short passes, long passes, interceptions and tackles, in both levels. The games were recorded through a Panasonic HC-V180 Camera, to allow their repeated viewing if necessary, so that the registration of actions was more efficient. All the games analysed had a duration of eight minutes, in the respective fields of the participating clubs. As previously mentioned for the 3x3 and 4x4 game models, the area used was half-field (20m x 20m), and in the 5x5 game model the area used was the entire field (40m x 20m).

**Overall study objective**

- Identify the game model that allows players to obtain a greater number of actions with the ball in rink hockey in the levels of «Under 8» and «Under 10».

**Specific objectives**

-Knowing which game model guarantees more ball actions for all players;

- Knowing if there is a relevant discrepancy in terms of game actions in athletes with the different game models;

- Knowing which type of system guarantees the most finishing situations for each player.

In terms of technical actions, the number of occurrences recorded in terms of Passes (Short and Long), Shots (on goal and out), time of action with the ball and goals conceded, saved shots, cuts and passes) and Goals for each of the 3x3, 4x4 and 5x5 game models,
In terms of tactical actions, the number of occurrences recorded in terms of tackles and interceptions, made by players in each of the 3x3, 4x4 and 5x5 game models. The Area Actions Ratio (AAR) results from dividing the total of actions by the area of the field. Pass: The pass consists of a transmission of the ball between members of the same team. To that extent, it is a means that unites the intentions of the players and translates the

offensive cohesion of a team, which is why, in some cases, it functions as an important indicator for the characterization of the style and method of play practiced. This category will be divided into long passes and short passes. It is considered a long pass whenever the pass crosses 3 or more sections (according to Garganta, 1997) and a short pass whenever the pass crosses a lower number of sectors in relation to the previous one.

Players Actions Analysed

Tackling: Tackling or recovery is the result of specific defensive technical-tactical actions to conquer the ball from the opponent, being of two types, defensive recovery, made in the defensive zone, and offensive recovery, after momentary loss of the ball in the offensive zone;

Interception: An interception is considered whenever a player wins the ball after intercepting a pass by the opposing team’s players.

Shot on goal: Hockey stick hitting action on the ball to achieve the purpose of the game, the goal. Shots on goal will be considered all balls aimed at the goal area, which hit the posts or bar, which are defended by the goalkeeper or goals.

Unsuccessful Shot: Any shot where the ball direction does not meet the previous requirements.

Actions: These are the total of all individual actions previously defined during a game.

Results

Descriptive statistics

This part presents the data collected from the assessment instruments, using the statistical and inferential analysis of the variables, which is presented from the tables.

According to table 2 the area 11 is where most of the shots take place (57%), the area closest to the goal, also 71% of shots are made from a central area of the field (Zones 5, 8 and 11), and even as they move away from goal area, the percentage of shooting is constantly decreasing.

In a first analysis the great differences between the small-sided games of 3x3 and 4x4 for the formal game (5x5) in the «Under 8» level is mainly in the greater use of individual actions such as shots on goal and shots missed. When the formal game (5x5) is played, with the increase in the number of players and the size of the field, the players start to use a more collective dynamic, so they use more passes, but interestingly the largest number of long passes is in the 3x3 game and the highest number of tackles and interceptions in the 4x4 game model.

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Analyzing with more detail this level in the 3x3 game model it has more shots (\( X = 29.25 \)), more shots on goal (\( X = 25.25 \)), more long passes (\( X = 30.25 \)) and more goals (\( X = 5.25 \)), the 4x4 model presents more interception situations in this level (\( X = 11.75 \)), and tackles (\( X = 17.00 \)) and the 5x5 game model obtains
more passing situations (X = 46.00), right passes (X = 34.50), and short passes (X = 30.25). However, this game model, it is weaker than the other models in situations such as: total of shots (X = 29.25), the short passes (X = 24.75), right passes (X = 14.50) and interceptions (X = 10.25) and the disarms (X = 14.50). As for the 4x4 model, only long passes are at a disadvantage for the other two game models compared in this study (X = 4.00). And the 5x5 game model in this level does not allow for so many situations of shots (X = 13.75), shots on goal (X = 11.50), shots outside (X = 2.25) and goals (X = 2.00) as the other two systems analysed.

The 4x4 game model is where there is a higher number of actions on the total of the games analysed (t = 923 X = 115.38 ± 17.62), as well as a number of tackles (t = 148 X = 18.50 ± 6.23) and interceptions (t = 99 X = 12 ± 2.56). In 3x3 games there are more shots (t = 236 X = 29.5 ± 4.87), and perhaps as a result of this indicator there are also more goals (t = 46 X = 5.75 ± 4.87). In the 5x5 games, on the other hand, a highest number of passes is made (t = 371 X = 46.38 ± 7.96), taking these two factors aside, in the remaining parameters are less actions, less goals and less shots are the ones that present lower levels than the other two game models analysed. The remaining parameters (passes and interceptions) registered a lower level compared to the other game models in the 3x3 model.

### Table 4

| Number of players | TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|------------------|----|-----|----|----|----|----|----|---|-------|
| 1                | 20.00 ± 3.00 | 2.00 ± 0.00 | 14.00 ± 1.00 | 46.00 ± 4.00 | 0.00 ± 0.00 | 12.00 ± 1.00 | 2.00 ± 0.00 | 1.00 ± 0.00 | 4.00 ± 0.00 |

### Table 5

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| 1  | 20.00 ± 3.00 | 2.00 ± 0.00 | 14.00 ± 1.00 | 46.00 ± 4.00 | 0.00 ± 0.00 | 12.00 ± 1.00 | 2.00 ± 0.00 | 1.00 ± 0.00 | 4.00 ± 0.00 |

### Table 6

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

### Table 7

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

### Table 8

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 10 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

### Table 9

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 10 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

Using the same test (Mann-Whitney) for a comparison between the 3x3 game model with the 5x5 game, within the «Under 8» level, we found that there are statistically significant differences (p<0.05) in favour of the 3x3 game model in: Total shots per game (p=0.021), on shots on goal per game (p=0.020), total passes per game (p=0.042), as well as right passes (p = 0.042), short passes (p = 0.021) and the number of goals scored per game (p=0.019).

Analysing the small-sided 3x3 game with the formal 5x5 game, within «under 10», we find that there is statistical difference (p<0.05) in favour of the 3x3 game in terms of: Total shots (p=0.018) per game, shots on goal per game (p=0.019) and the number of goals scored per game (p=0.013).

* Sig a = 0.05

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|----|-----|----|----|----|----|----|---|-------|
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### Table 9

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 10 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

Through the Mann-Whitney non-parametric test, we resorted to a brief statistical analysis of the small-sided 3x3 and 4x4 games within the Under 8 and Under 10 levels and none of the game actions studied in both analysed levels registers a statistically difference between both game models.

### Table 4

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

### Table 5

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

### Table 6

| TS | SoG | SM | TP | RP | SP | LP | T | Goals |
|----|-----|----|----|----|----|----|---|-------|
| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

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|----|-----|----|----|----|----|----|---|-------|
| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

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| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

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|----|-----|----|----|----|----|----|---|-------|
| Under 8 | 0.019* | 0.019* | 0.109 | 0.046 | 0.771 | 0.767 | 0.770 | 0.882 | 0.769 |

Through the Mann-Whitney non-parametric test, we resorted to a brief statistical analysis of the small-sided 3x3 and 4x4 games within the Under 8 and Under 10 levels and none of the game actions studied in both analysed levels registers a statistically difference between both game models.
The total shots (TS) and shots on goal (SoG) reach high values in the 5x5 game. The difference is significant as TS and SoG values in the 3x3 game model are lower. The total number of shots (SM) is also lower in the 3x3 game model, while shots missed (SM) are highest in the 3x3 game model. The total number of passes (TP) is lower in the 3x3 game model, and the number of right passes (RP) and short passes (SP) is higher in the 3x3 game model. The number of long passes (LP) is higher in the 3x3 game model, and the number of interceptions (Int) is lower in the 3x3 game model. The number of goals (G) is lower in the 3x3 game model. The number of tackles (T) is higher in the 3x3 game model. The number of total actions (Actions) is lower in the 3x3 game model.

Table 14 - Correlation of the game area with actions.

| Game model | 3x3 | 4x4 | 5x5 |
|------------|-----|-----|-----|
| 3x3/4x4    | 0.010 | 0.0462 |
| 3x3/5x5    | 0.014 | 0.0462 |
| 4x4/5x5    | 0.010 | 0.0462 |

Through the Spearman’s correlation to understand how, within the analyzed field areas, they interfere with the game’s actions, in the 3x3 game model as the playing area available to athletes increases, the number of actions goes down, already in the 4x4 game model as the playing area increases the number of game actions also increases. After testing the models for the playing area as a moderating and mediating variable in relation to the total number of actions, number of passes and goals, these models did not reveal any direct or indirect effects regarding the variable under study.

Discussion

In a first analysis that there are no significant differences according to the number of actions between the 3x3 and 4x4 game models.
the game of 3x3 and 4x4 in both levels analysed. However, according to Ferreira (2013) it is necessary to adapt the game to the child and not force the child to adapt to the adult game, so the 4x4 game model will still be beneficial for children because it allows a greater similarity with the game of adults.

Clemente et al. (2016) defend that the small-sided games increases the dynamics of the game, increases the actions with the ball so that it reaches the attack faster, like the pass and the shots. It appears that there are significant differences in the small-sided 4x4 game with the formal 5x5 game in the Under 8. Hill-Haas et al. (2011) points out that the number of players is also a factor that can influence the intensity of the SSD. And after this analysis we realized that comparing these two types of small-sided game models in the level of Under 10 in the analysed games there are no significant differences in the game interactions. This aspect agrees with Hill-Haas et al. (2011), who emphasizes that the small-sided games bring more intensity than the formal games can obtain, emphasizing that the great advantage of the small-sided game depends on the several models of game adopted. And with this study we realized that there was much more intensity or better there were many more actions, offensive than defensive, than in the formal game, for example, there were many more goals and finishing actions with significant differences.

When comparing different levels where there are no significant differences in some variables, this study agrees with Vaz, Gayo, Valente, Coelho and Silva (2007) who studied ball possession in 12 complete semi-final and final games of the European Championship and the World Championship in the categories Under 17, Under 20 and Seniors, and noted that as the age of the groups increased, the possession of the ball increased. For Silva (2017) team sports games are characterized by their high unpredictability, great diversity and the constant search for decision making, so the games will be richer the more the number of decisions that each player makes during the game, either right or wrong. When comparing age levels in relation to their action’s productivity, we realize that there are no significant differences in this case, which reveals that the fact that athletes can be more developed both physically and technically, as the games are levelled by this limit of both age groups provide their athletes with the same constant search for individual and collective decision-making and actions.

For Vaz (2000) one of the most important objectives of research in TS is to identify the factors that are directly linked to the performance and effectiveness of the players of a team, which complements our analysis where we realize that the only significant difference in the comparison of different ages, we realized that this factor (age) can influence the effectiveness of the players. Passos, Araújo and Davids (2013) address space-time interactions as one of the most limiting factors for players, which not agrees with this study that reveals that as the playing field increases, players’ actions decrease. According to McGarry, Anderson, Wallace, Hughes and Franks (2002) they state that in game analysis it is essential to identify time-space patterns and how they can interfere with the behaviour of players and teams, which is seen in this study.

Conclusions

The game model with more finishing actions performed was in the 3x3 in which there were more shots (236) and more goals (46). It was also possible to verify that the zone where more shots were recorded was zone 11 (according to the field diagram) with more than 57% of the same achievements in that zone, and that it was in the 3x3 game that more short and long passes were recorded. This study also allowed to realize that in the analysed games it is perceived that there is a lot of discrepancy in the analysed game dynamics. In first place, the small-sided games allows more game actions than the formal game, since the formal game allows only 0.99 actions per player per square meter while 3x3 allows 1.57 actions and 4x4 allows 2.18 actions which gives us a difference of 1.18 actions per player per square meter between the most productive diagram scheme and the least productive, which leads us to conclude that there are very discrepant differences between these game models, perhaps the 5x5 with all its breadth and complexity is still very demanding in physical and technical terms for the age group of the ages analysed since they are not so physically developed that their game is not as intense as in previous models, because in these levels the 5x5 becomes a very monotonous game.

Within the small-sided game models, 4x4 in a smaller field is what allowed children more actions and more experiences. But with this study its concluded that the game of 4x4 in a smaller field allows the players more preponderant actions in the game. In the games analysed, the 4x4 game model obtained a total number of 923 actions, slightly ahead of 3x3 with 911. However,
if we divide the total actions by the number of field players, then 3x3 allows a total of 303 to each field player and in turn the 4x4 game model only allows 230 actions per field player. Its concluded that the number of actions per player per square meter in the 4x4 is higher with 2.18 actions and the 3x3 only produces 1.57 actions. Continuing this analysis, it allowed to realize that within the amplitudes of fields analysed the small-sided game model 4x4 is the only one that increases the number of actions per game as the field increases. This allows to conclude that the implementation of the reduced 4x4 game model in the levels of Under 8 and Under 10 can be beneficial for the training of young rink hockey players.

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