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**Original Article**

# A Diagnostic of Recreational Soccer Practice for 11-12-Year-Old Children during their Leisure Time

**Manuel Gutiérrez Cruz**[1]* https://orcid.org/0000-0002-1445-8659

**Yury Douglas Barrios Palacios**[1] https://orcid.org/0000-0001-6759-8076

**Fernando Cedeño-Alejandro**[1] https://orcid.org/0000-0002-8973-9834

**Luigi León López**[1] https://orcid.org/0000-0002-2118-8642

[1]University of Guayaquil, Ecuador.

*Corresponding author: manuel.gutierrezc@ug.edu.ec

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## ABSTRACT

**Introduction**: This study is part of a community project between the University of Guayaquil and the Non-Governmental Organization Norwegian Alliance Mission, in Ecuador. It engages with vulnerable and low-income sectors in Guayaquil, whose work stems from a diagnostic of the physical, technical, and anthropometric conditions of adolescents in Trinidad de Dios, Monte Sinai.

**Aim**: To diagnose the physical, technical, and anthropometric status of 11-12-year-old children in the community of Monte Sinai, Guayaquil, for recreational soccer practice.

**Materials and methods**: The empirical methods used were measurement and survey, the Bangsbo sprint test, 10 x 5 speed test, the ball-carrying test, and the Body Weight Index (BWI).

**Results**: Several considerations for the practice of soccer during the leisure time of the age group studied.

**Conclusions**: There is high motivation to perform sports activities during the leisure time, along with a priority especially oriented to soccer practice, which favors the implementation of a project for the recreational practice of the sport by the group of individuals in the study.

**Keywords**: Physical, technical, and anthropometric conditions.

## INTRODUCTION

Sports practice in Ecuadorian communities is one of the priorities of the National Development Plan 2017-2021, considering the potentialities of this phenomenon for healthy use of leisure time by vulnerable age groups. This study is part of a project between the University of Guayaquil and the NGO Norwegian Alliance Mission, in Ecuador. The project pursues the healthy use of leisure time by the local inhabitants, including the recreational practice of soccer as a fundamental means to achieve this end. It helps prevent the development of inappropriate social habits, especially behaviors that do not correspond with the ethical principles demanded by the Ecuadorian citizens.

In Ecuador, soccer is a social manifestation that gathers thousands and motivates a large part of the society for its practice and follow-up. In that sense, the frequent practice of this sport in vulnerable communities encourages healthy practices and recreational habits significantly.

Based on various up-to-date studies on leisure time use, a new concept of activity has evolved, which creates a favorable setting for free time use, concerning alternative physical activities, particularly in the so-called risk or vulnerable communities. In that sense, Álvarez (2015), Castro, L. & Pérez (2017), and Bermúdez (2020) claimed that the practice of recreational sports activities is not only a pleasant way of spending free time, but also a way of using leisure time in society so that it contributes to the development of man's possibilities, by rooting their values as humans and as members of communities, using the existing time motivatingly to enhance the professional, cultural, artistic, sports, and social moments hand in concert with education, self-education, physical-psychic hygiene, amusement, and culture in general.

The related literature refers to the term *recreation* in 1899 first, by Thorstein Veblen. Then several authors dealt with this topic. Pérez, A. (2003) noted the existence of various conceptual approaches to recreation, based on different authors, like Puig & Trilla, (1985); Caivano, (1987); Olivera, J., and Olivera, A. (1995); Torre, E., and Cárdenas, D. (1999); Pérez, A. (2003); Ballesta, C. (2013); Carballosa, L. M. (2017), who claimed the use of leisure time in favor of personal growth through participatory actions.

The insertion of Physical Culture professionals in general, within the education of vulnerable communities, will guide the motivations of sensitive age groups to practice collective activities mostly. These will lead to the development of educational values such as social communication, creativity, co-education, diversity, cooperation, and team spirit, solidarity, sportiness, and respect for the partners, opponents, and referees.

Upon stating the need to consider soccer practice as a recreational means of leisure time, an 11-12-year-old children sample from the community of Monte Sinai, south of Guayaquil was selected. The purpose was to diagnose the physical, technical, and anthropometric status of these subjects for the recreational practice of soccer.

## MATERIALS AND METHODS

The study comprised a population of 66 adolescents aged 11-12, from the Trinidad de Dios sector, Monte Sinai, Guayaquil, Ecuador. The non-probabilistic sample consisted of 21 children (21.8 %) selected according to the inclusion criteria. The criteria for the study were,

- Availability for the project.
- Motivation to practice soccer.
- Family support for the practice of soccer.

A survey was applied to determine the level of motivation to play soccer, the organization, and the occupation of leisure time by the children. Measurement was used as a general method, which focused on the application of the Bangsbo sprint test, the BWI test, and the ball carrying test.

## RESULTS AND DISCUSSION

The studies on the diagnostic of motor conditions of certain subjects are diverse and include the community, educational facilities, sports clubs, and general organizations. Bendrath, E.A. *et al.,* (2013) studied was conducted in a high school, and used BWI and flexibility tests in more than 200 subjects. The tests were related to the status of the body composition with the development of flexibility in the subjects studied.

A study conducted by Martínez, E.J. (2004), sought to evaluate the physical condition of 505 students aged 11-19, from basic and high school education. It included the application of several tests, such as the 10 x 5 m speed test to measure the displacement speed and agility of an individual. This test demonstrated that the male subjects develop speed until they have turned 18, whereas the female subjects reached their best results at 13. This study also included the 20-meter speed test to measure the reaction speed, and the Tapping test using the arms, to assess the cyclic speed of arm movements.

Sánchez, J., Blázquez, F., Gonzalo, A., Yagüe, J.M. (2005) dealt with the application of a training system to develop speed endurance in soccer players, using exercises with and without the ball, as well as high-intensity work in 30-60 seconds and recovery periods at a 1:1 density, or that change the working loads, density, and frequency, during the accumulation and realization modules, which are common in the ATR model. These authors suggested the Balsom test (1993), consisting of running around a triangle (9.1 meters each side A-B-C) at the fastest speed. Then they had 42 seconds to rest actively in a recovery circuit located at the perimeter of the penalty area.

The current diagnostic relies on the above results. Before the motor tests stated in the methodology were performed, a group of 11-12-year-old children from the Trinidad de Dios sector, Monte Sinai, Guayaquil, were surveyed in relation to the activities they performed in their leisure time, following an ascending order (1-7), which produced the following results (Table 1).

**Table 1.** Priority order of leisure activities

| A SURVEY OF 11-12-YEAR-OLD CHILDREN | | | | | | | |
|---|---|---|---|---|---|---|---|
| LEISURE ACTIVITY | **SCORE** | | | | | | |
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| PLAYING AT HOME | 2 | 5 | 2 | 4 | 5 | 3 | 0 |
| PLAYING SPORTS | 0 | 0 | 0 | 0 | 4 | 5 | 12 |
| STUDYING | 12 | 4 | 3 | 2 | 0 | 0 | 0 |
| WATCHING TV | 3 | 3 | 3 | 6 | 2 | 3 | 1 |
| HANGING OUT WITH FRIENDS | 2 | 7 | 5 | 3 | 0 | 4 | 0 |
| WORKING | 2 | 1 | 3 | 3 | 0 | 0 | 0 |
| OTHERS | 0 | 1 | 5 | 3 | 5 | 7 | 0 |

As seen, 57.1 % of the children (12) preferred to practice sports during their leisure times, while 32.9 % evaluated it as 5 and 6 in the priority order 5 and 6. Interestingly, the lack of motivation over the study in 12 children represented the lowest value (1) out of a maximum of seven (57.1 %). Significantly, nine children were somehow linked to some type of job (42.8 %), though they were not highly motivated.

Considering the motivation for sports, in particular, they were asked to list the three sports they liked to play most in their free time by order of priority. Eighteen of the 21 individuals (85.7 %) chose soccer as the first sport, and the other 3 (14.3 %) ranked soccer second. This result shows the high motivation of the children toward the practice of soccer during their leisure time, favoring their adhesion to the community project implemented.

The Bangsbo test was applied to all 21 children to evaluate the status of speed endurance, considering the criteria of the author (Bangsbo, 1994), who considered the inclusion of a maximum sprint between A and B (34.2 m), then jogging slowly for recovery to D, passing by C in 25s. After going through B, the recovery time starts, and during that period, the athlete receives verbal information about the recovery time elapsed. This progression is repeated seven times, and each series time is recorded (Figure 1).

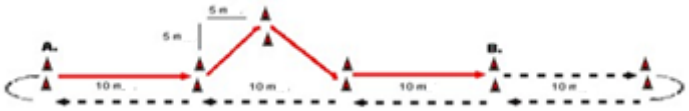


**Fig. 1.** The route of the Bangsbo sprint test

The results of each seven legs are shown below (Table 2), (Table 3), (Table 4).

**Table 2**. Test results for the 7 legs

| No. | SPRINT TIME (LEG) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **T1** | **T2** | **T3** | **T4** | **T5** | **T6** | **T7** |
| **1** | 8.93 | 8.50 | 8.60 | 8.97 | 8.66 | 8.88 | 8.75 |
| **2** | 10.00 | 10.60 | 10.25 | 11.03 | 10.13 | 10.03 | 10.50 |
| **3** | 10.22 | 9.94 | 9.34 | 10.57 | 10.35 | 9.99 | 10.13 |
| **4** | 8.66 | 9.00 | 9.00 | 9.19 | 9.34 | 9.28 | 9.31 |
| **5** | 10.22 | 10.34 | 10.40 | 10.12 | 9.75 | 9.47 | 9.93 |
| **6** | 8.53 | 8.60 | 8.79 | 8.78 | 8.72 | 9.19 | 8.63 |
| **7** | 9.53 | 10.31 | 9.81 | 10.83 | 11.13 | 10.85 | 11.22 |
| **8** | 9.47 | 9.80 | 10.59 | 9.72 | 11.13 | 10.25 | 10.12 |
| **9** | 8.43 | 9.90 | 8.38 | 7.12 | 8.50 | 8.30 | 8.84 |
| **10** | 8.78 | 8.62 | 9.22 | 9.25 | 9.25 | 9.41 | 10.60 |
| **11** | 9.37 | 9.31 | 9.41 | 9.35 | 8.84 | 8.56 | 9.25 |
| **12** | 10.21 | 10.25 | 10.66 | 11.22 | 10.88 | 10.40 | 10.81 |
| **13** | 9.19 | 9.16 | 8.35 | 8.66 | 8.91 | 8.53 | 8.84 |
| **14** | 9.87 | 11.03 | 12.28 | 13.20 | 13.25 | 13.41 | 13.50 |
| **15** | 9.13 | 9.22 | 9.06 | 9.22 | 9.28 | 9.31 | 9.16 |
| **16** | 10.81 | 10.32 | 10.09 | 9.28 | 10.38 | 9.78 | 9.12 |
| **17** | 10.34 | 10.59 | 10.56 | 10.18 | 10.19 | 10.75 | 10.35 |
| **18** | 8.66 | 9.18 | 8.97 | 8.59 | 8.78 | 8.68 | 8.94 |
| **19** | 9.62 | 9.22 | 8.85 | 8.88 | 8.16 | 8.60 | 8.91 |
| **20** | 9.00 | 8.90 | 8.75 | 8.97 | 9.07 | 9.09 | 9.35 |
| **21** | 9.90 | 8.91 | 8.43 | 8.68 | 8.57 | 8.40 | 8.84 |

**Table 3** Results of the best and worst times, mean time, and fatigue index

| TIME SLOWEST | BEST **TIME** | ASSESSMNT. | TIME **MEAN** | ASSESSMNT. | INDEX **FATIGUE** | ASSESSMNT. |
|---|---|---|---|---|---|---|
| **8.97** | 8.50 | Good | 8.76 | Good | 47.00 | Excellent |
| **11.03** | 10.00 | Bad | 10.36 | Bad | 103.00 | Average |
| **10.57** | 9.34 | Bad | 10.08 | Bad | 123.00 | Bad |

| | | | | | | |
|---|---|---|---|---|---|---|
| **9.34** | 8.66 | Average | 9.11 | Average | 68.00 | Very good |
| **10.40** | 9.47 | Bad | 10.03 | Bad | 93.00 | Average |
| **9.19** | 8.53 | Average | 8.75 | Good | 66.00 | Very good |
| **11.22** | 9.53 | Bad | 10.53 | Bad | 169.00 | Bad |
| **11.13** | 9.47 | Bad | 10.15 | Bad | 166.00 | Bad |
| **9.90** | 7.12 | Very good | 8.50 | Good | 278.00 | Bad |
| **10.60** | 8.62 | Average | 9.30 | Average | 198.00 | Bad |
| **9.41** | 8.56 | Average | 9.16 | Average | 85.00 | Good |
| **11.22** | 10.21 | Bad | 10.63 | Bad | 101.00 | Average |
| **9.19** | 8.35 | Good | 8.81 | Good | 84.00 | Good |
| **13.50** | 9.87 | Bad | 11.67 | Bad | 363.00 | Bad |
| **9.31** | 9.06 | Average | 9.20 | Average | 25.00 | Excellent |
| **10.81** | 9.12 | Average | 9.97 | Bad | 169.00 | Bad |
| **10.75** | 10.18 | Bad | 10.42 | Bad | 57.00 | Very good |
| **9.18** | 8.59 | Average | 8.83 | Good | 59.00 | Very good |
| **9.62** | 8.16 | Good | 8.89 | Good | 146.00 | Bad |
| **9.35** | 8.75 | Average | 9.02 | Average | 60.00 | Very good |
| **9.90** | 8.40 | Good | 8.82 | Good | 150.00 | Bad |

**Table 4**. Considerations to evaluate the best time, the worst time, and the fatigue index

| BEST TIME | MEAN TIME | FATIGUE INDEX (FI) | ASSESSMENT |
|---|---|---|---|
| **BT=<7** | MT=<7.50 | FI<50 | EXCELLENT |
| **7<BT=<7.75** | 7.50<MT=<8.25 | 50=<FI<70 | VERY GOOD |
| **7.75<BT=<8.50** | 8.25<MT=<9 | 70=<FI<90 | GOOD |
| **8.50<BT=<9.25** | 9.00<MT=<9.75 | 90=<FI=<110 | AVERAGE |
| **BT>=9.25** | MT>=9.75 | FI>110 | BAD |

This table is helpful to qualify the children in the study; it showed that in the best time, 16 out of the 21 children were between Average and Bad, accounting for 76.2%, whereas only one subject was Very Good (4.7 %). These results evidenced problems in speed capacity.

Regarding the mean time (the average time comprising the seven legs), nine subjects were in the Bad category (42.8 %). Remarkably, no subject in the study was in the Very Good or Excellent categories, evidencing shortcomings in the speed endurance capacity.

As to the fatigue index (FI), nine subjects (42.8 %) were included in the Bad category; However, in this test, six subjects were between Very Good and Excellent (28.5 %), very similar to the ones in the Average category. Hence, except for some individuals, most subjects in the study evidenced recovery difficulties.

Finally, to achieve the purpose of this study, a ball-carrying test was made, consisting in calculating the time differences in which the subject completes the

route with or without the ball; that is, the technical qualification of the player based on the difference between the two times (time they take to complete the route with the ball, and the time they take to finish it without the ball), calculated as a percentage. (Figure 2).

% = (Time consumed without the ball/t with the ball) x 100

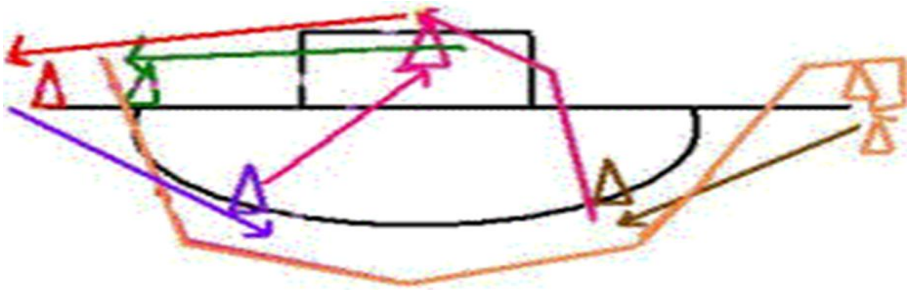

**Fig. 2.-** Route with and without the ball

Therefore, the closer the percentage is to 100%, the greater will the athlete's technical qualification to carry the ball. This test showed the following results (Table 5).

**Table 5**. Results of the ball carrying test

| No. | BALL CARRYING TEST | | | | |
|---|---|---|---|---|---|
| | T. Wo/B | T.With/B | TwoB/TwithB | % | ASSESSMENT |
| 1 | 13.12 | 22.30 | 0.58 | 58 | BAD |
| 2 | 14.20 | 23.90 | 0.59 | 59 | BAD |
| 3 | 13.20 | 21.30 | 0.62 | 62 | AVERAGE |
| 4 | 13.70 | 17.10 | 0.80 | 80 | VERY GOOD |
| 5 | 15.20 | 26.40 | 0.58 | 58 | BAD |
| 6 | 12.50 | 21.20 | 0.59 | 59 | BAD |
| 7 | 12.50 | 15.40 | 0.81 | 81 | VERY GOOD |
| 8 | 11.60 | 18.50 | 0.63 | 63 | AVERAGE |
| 9 | 12.40 | 21.20 | 0.58 | 58 | BAD |
| 10 | 14.30 | 22.40 | 0.64 | 64 | AVERAGE |
| 11 | 13.10 | 18.30 | 0.72 | 72 | GOOD |
| 12 | 11.20 | 20.20 | 0.55 | 55 | BAD |
| 13 | 13.70 | 20.50 | 0.67 | 67 | AVERAGE |
| 14 | 15.30 | 28.40 | 0.54 | 54 | BAD |
| 15 | 12.50 | 21.30 | 0.59 | 59 | BAD |
| 16 | 12.40 | 19.30 | 0.64 | 64 | AVERAGE |
| 17 | 13.50 | 22.40 | 0.60 | 60 | AVERAGE |
| 18 | 14.50 | 20.40 | 0.71 | 71 | GOOD |
| 19 | 12.80 | 22.50 | 0.57 | 57 | AVERAGE |
| 20 | 13.50 | 24.10 | 0.56 | 56 | BAD |
| 21 | 13.60 | 19.60 | 0.69 | 69 | AVERAGE |

The results from this test showed that nine (9) subjects were assessed as Bad, and eight (8), as Average, so it can be inferred that 80.9 % of children had serious

differences between the time they completed the test without the ball and with the ball, with technical differences in ball carrying. It evidenced the need to work on this technical fundamental during the implementation of the project.

The 10 x 5 meter speed test was based on the methodology established by Martínez, E.J. (2004) whose main objective was to measure the motion speed and agility, which according to this author, the speed race (Shutte run)10 x 5 m was 0.80 reliable in children between 11 and 19. This test requires a flat and smooth surface with two parallel lines separated by 5 m, and chalk to draw the lines and the stopwatch. For the evaluation, the study done by García Manzo, (1994), was assumed, which conceives times between 4.2 and 3.9 seconds for 11-12-year-old children. The results are shown in the following table (Table 6).

**Table 6**. – 10 x 5 meter speed tests

| No. | TIME | ASSESSMENT |
|---|---|---|
| 1 | 3.9 | VERY GOOD |
| 2 | 4.3 | AVERAGE |
| 3 | 4.4 | AVERAGE |
| 4 | 4.2 | GOOD |
| 5 | 4.5 | BAD |
| 6 | 4.6 | BAD |
| 7 | 3.9 | VERY GOOD |
| 8 | 4.3 | AVERAGE |
| 9 | 4.5 | BAD |
| 10 | 4.3 | AVERAGE |
| 11 | 3.9 | VERY GOOD |
| 12 | 4.7 | BAD |
| 13 | 4.3 | AVERAGE |
| 14 | 4.8 | BAD |
| 15 | 4.6 | BAD |
| 16 | 4.2 | GOOD |
| 17 | 4.4 | AVERAGE |
| 18 | 4.2 | GOOD |
| 19 | 4.4 | AVERAGE |
| 20 | 4.8 | BAD |
| 21 | 4.1 | GOOD |

The results of the 10 x 5 meter speed test showed that seven of the 21 children aged 11-12 were between the Very Good and Good categories, accounting for 33.3 %. No subject was assessed as Excellent, while most children (66.6 %) were between the Average and Bad categories. These results demonstrated the existence of shortcomings in the development of physical capacity.

The BWI test was performed for the anthropometric measurements, which allowed for the classification of the subjects into Low Weight, Normal Weight, Overweight, Obese, Obese grade I, II, III. The Guedes and Guedes' (2006) criteria were assumed for that classification, calculated as BWI = weight (kg)/height (m), which is shown in the tables below (Table 7) (Table 8).

**Table 7** BWI classification according to the WHO

| BWI | Category |
|---|---|
| Low weight | < 18.5 |
| Normal weight | 18.5 – 24.9 |
| Overweight | 25.0 – 29.9 |
| Grade I obesity | 30.0 – 34.5 |
| Grade II obesity | 35.0 – 39.9 |
| Grade III obesity | > 40.0 |

**Table 8**. Application results

| No. | Weight (kg.) | Height | Height in seated position | Arm length | BWI | Observation |
|---|---|---|---|---|---|---|
| **1** | 35.5 | 1.43 | 65.8 | 1.4 | 17.36 | Low weight |
| **2** | 39.45 | 1.46 | 74.5 | 1.47 | 18.51 | Normal |
| **3** | 42.8 | 1.51 | 73.5 | 1.51 | 18.77 | Normal |
| **4** | 41.7 | 1.49 | 70.8 | 1.53 | 18.78 | Normal |
| **5** | 44.1 | 1.42 | 74.6 | 1.59 | 21.87 | Normal |
| **6** | 32 | 1.31 | 69 | 1.29 | 18.65 | Normal |
| **7** | 32.35 | 1.31 | 70 | 1.32 | 18.85 | Normal |
| **8** | 34.85 | 1.49 | 72.5 | 1.5 | 15.70 | Low weight |
| **9** | 40.2 | 1.55 | 73.1 | 1.6 | 16.73 | Low weight |
| **10** | 34.15 | 1.46 | 72.8 | 1.44 | 16.02 | Low weight |
| **11** | 57.55 | 1.45 | 74.4 | 1.5 | 27.37 | Overweight |
| **12** | 39.8 | 1.4 | 69.2 | 1.34 | 20.31 | Normal |
| **13** | 30 | 1.35 | 69 | 1.36 | 16.46 | Low weight |
| **14** | 31.75 | 1.4 | 70.4 | 1.44 | 16.20 | Low weight |
| **15** | 51.55 | 1.36 | 72 | 1.39 | 27.87 | Overweight |
| **16** | 47.1 | 1.48 | 74.1 | 1.51 | 21.50 | Normal |
| **17** | 33.25 | 1.53 | 74.9 | 1.58 | 14.20 | Low weight |
| **18** | 30.25 | 1.42 | 69.9 | 1.4 | 15.00 | Low weight |

| | | | | | | |
|---|---|---|---|---|---|---|
| **19** | 46.3 | 1.54 | 75.6 | 1.6 | 19.52 | Normal |
| **20** | 30 | 1.47 | 71 | 1.46 | 13.88 | Low weight |
| **21** | 34.1 | 1.45 | 72.5 | 1.45 | 16.22 | Low weight |

The results showed that 10 of the 21 subjects in the study were low weight (47.6 %). Out of the nine subjects with a normal weight (42.8 %), all were near the low weight limit, evidencing nutritional problems and muscle growth weaknesses, producing deficiencies in the physical capacities evaluated.

## CONCLUSIONS

The application of the survey to check the level of motivation to perform sports activities (especially soccer) and the organization of leisure in 11-12-year-old children, from the Trinidad de Dios sector, Monte Sinai, Guayaquil demonstrated the high motivation to practice sports as a leisure activity, particularly oriented to the game of soccer. It favored the implementation of a project for the recreational practice of the sport in the group of individuals in the study.

The Bangsbo Sprint test and the 10 x 5 meter sped test demonstrated the existence of deficient physical capacities of speed and speed endurance, with over 50% of the subjects in the Bad category. Difficulties were also observed in the fatigue index, along with an inadequate muscle development that hinders speed.

The the ball carrying test results were poor when contrasting the motion with the ball to move without the ball. It showed the lack of ball control, fundamental technical errors, lack of coordination, movement fluency, and inaccurate basic techniques for the ages of the subjects selected for the study.

The BWI showed serious difficulties in terms of body condition of the subjects, as 47.8 % was in the low weight category, and the ones in the normal weight were over the minimum adequate index to be included in that category, thus limiting the physical conditions to develop this sport, and consequently, the existence of poor muscle development that hinders speed.

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