



Futsal in children and adolescents - a systematic review 2015-2020

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Authors' Contribution: A – Study Design, B – Data Collection, C – Statistical Analysis, D – Manuscript Preparation, E – Funds Collection

Abstract

Introduction: Futsal is a sport that is practiced almost everywhere in the world and that has been gaining in number of followers throughout the years. The objective of this work has been to carry out a review of the scientific literature from 2015 to 2020 that addresses the field of Futsal, selecting only articles related to children, adolescents and young people for content analysis. *Material and Methods:* A systematic review was carried out from 2015 to 2020, searching with the terms of the UNESCO Thesaurus: "futsal", "children", "adolescents" and "young people" in Scopus, Web of Science and Dialnet, allowing the selection of original articles (experimental, descriptive, quasi-experimental and / or case studies), which included information from this line. *Results:* A total of 519 articles were found, although after applying the inclusion criteria of the review they were reduced to 68 articles. These publications were divided into four main categories: 1) Physical condition, body composition, diet and nutrition in schoolchildren who practice Futsal, 2) Motor skills in schoolchildren who practice Futsal, 3) Motivations for practicing Futsal and 4) Other topics investigated; doing a discussion about each of these categories. *Conclusions:* This systematic review makes it possible to quickly and easily observe the analysis of research on futsal in young people and as a school sport, as well as to identify the most relevant scientific questions at the present time.

Keywords: futsal, indoor soccer, children, adolescents, young people

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www.physactiv.eu

Received: 17.10.2020; Accepted: 28.11.2020; Published online: 4.08.2021

Cite this article as: Sanmiguel-Rodríguez A, Arufe Giráldez V. Futsal in children and adolescents - a systematic review 2015-2020. Phys Activ Rev 2021; 9(2): 27-39. doi: 10.16926/par.2021.09.19

INTRODUCTION

Futsal is a sport that is practiced almost everywhere in the world and that has been gaining in the number of followers throughout the years. Although it is a recent sport, its rules have evolved rapidly, causing profound changes in the physical, technical and tactical aspects of the game. Among children, their practice begins early and futsal schools are to a great extent responsible for the sports initiation of children, however, most of them do not have an organized methodology [1].

Futsal has the characteristic of being an invasion sport and occupies an especially important role among team sports spread in the school environment [2]. Is a popular sport with great support among school-age children and adolescents [2-7] that seek to develop and improve physical and motor skills [3].

Due to the increase in courts in urban areas and the ease of its practice, since it is a sport that uses a reduced space and few players, the practice of Futsal has grown among schoolchildren [6,8]. Thus, the futsal modality is probably the most sought after in schools, sports initiation schools and also in the free time of most children. Likewise, the family has a fundamental influence on the sporting experience of their children, however, divergent expectations can frustrate and hinder the sporting and human development of the child. Given this, it seems relevant that the teacher and / or trainer know the motivations and expectations of both the children who practice sports and their parents [9]. School sports programs generally show two well differentiated aspects, the aspect of sports performance managed by entities linked to sports management and the educational aspect managed by the educational administration, in this way futsal schools are created within educational centers and from sports clubs [10].

Futsal is a sport with a variety of efforts, requiring low to high intensity performance. Energy expenditure in turn becomes high in these athletes, so the need for nutrients for adequate metabolic recovery must come from a good diet, thus guaranteeing the athlete's performance [11]. Adolescence is the phase from 10 to 19 years old and is the second period in which growth has its maximum speed. Adolescent athletes, depending on the energy demand, can present significant dietary errors [12]. The practice of sport in adolescence is of utmost importance, since it generates a series of benefits for the health of the individual, such as a significant reduction in body fat, increased basal metabolism, beneficial changes in eating patterns and better image and bodily expression [13]. Considering the modernization of the pedagogical-sports process, the complexity of the human being and the professionalization of futsal, it is necessary to analyze current ideas about the initiation and training of athletes in futsal [14]. Likewise, physical activity plays a crucial role in building bone mass during childhood and adolescence, and high-impact sports activities and weight bearing are more beneficial [15].

Finally, it should be noted that any sports practice carried out in childhood must have a global focus on the development of the child, not only improving their physical condition but also educating in values, working on the different psychological and psychosocial variables and enhancing their psychomotor development and basic motor skills [16].

Therefore, the objective of this study has been to carry out a review of the scientific literature from 2015 to 2020 that addresses the field of Futsal at school age in order to analyze and categorize the works found and update the publications and possible future lines of research.

METHODS

The bibliographic review is a type of scientific article that, without being original, collects the most relevant information on a specific topic. This review can be considered an Overview review [17], a type of generic systematic review that examines the literature globally and categorizes the specific topics found. Unlike other types of reviews, it does not focus on the analysis of a specific context, but rather seeks to search for specific contexts studied as a result of a general context, offering the reader a mapping of topics specifically investigated within a general context.

Thus, for this review, a bibliographic search was carried out in three important databases were selected, the international Web of Science database that collects more than 170 million references, the international Scopus database of the Elsevier Group for having more than 70 million references and the Spanish database Dialnet for having a significant number of indexed documents related to football. The following terms were selected from the UNESCO Thesaurus to establish the different combinations of Boolean operators [futsal, children, adolescents, youth]. The inclusion criteria used in the review were the following:

- 1) Articles published from January 1, 2015 to August 1, 2020.
- 2) Articles that address any type of research related to futsal in the international context, incorporating experimental, descriptive, quasi-experimental studies and / or case studies.
- 3) That the study was carried out with a sample of school-age players, or analyse some variable related to this area.

A total of 519 articles were found, but after removing the duplicated manuscripts, the search brought together a total of 149 documents for analysis. After applying the selection criteria, a total of 68 articles that provided a scientific method and met the inclusion criteria listed above were computed. Thus, the work schedule for the search for information had four different phases, as can be seen below and in the flow diagram represented graphically in Figure 1.

1st Phase: Search and selection of descriptors through the UNESCO Thesaurus. 2nd Phase: Detailed search in Web of Science, Scopus and Dialnet scientific databases, using the inclusion criteria described above. 3rd Phase: Analysis of the content of the articles and classification by subject. 4th Phase: Categorization of articles and preparation of the manuscript: systematic review.

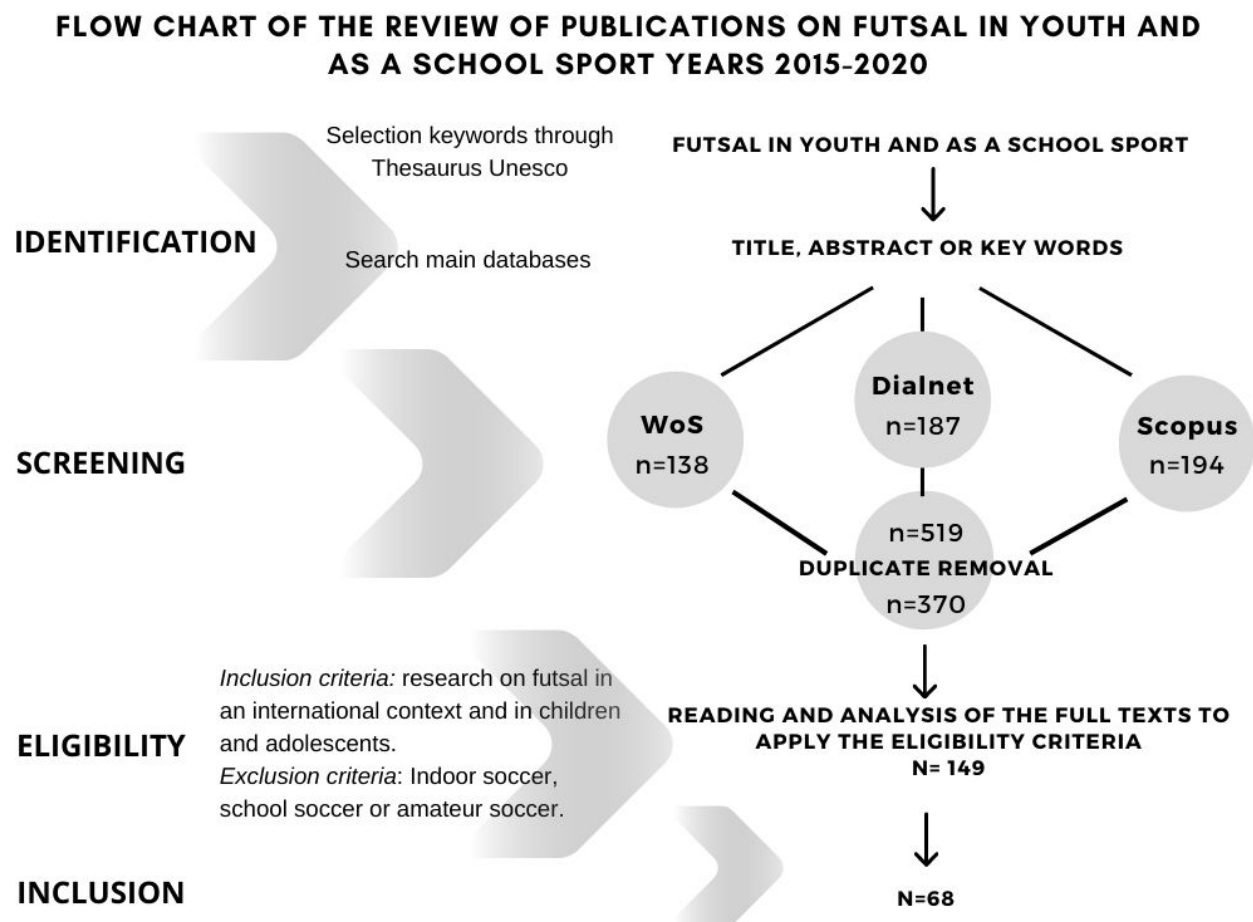


Figure 1. Flow diagram of the systematic search process.

RESULTS

Once the 68 definitive articles had been selected, a detailed reading of all the articles was made individually and a first categorization was elaborated. The second phase was the analysis of the different articles and the specification of the four definitive categories. As a result of this deductive procedure, by triangulating the information, the final classification of the articles was carried out in the four mentioned categories (Table 1).

As can be seen in table 1, from 2015 to 2020 the category of physical condition, body composition, diet and nutrition in schoolchildren who practice Futsal has gathered a total of 22 studies. The category of motor skills in schoolchildren who practice Futsal has had a total of 17 studies. The category of motivations for the practice of Futsal has gathered a total of 11 studies and, finally, the category of other topics studied has gathered a total of 18 studies.

Table 1. Synthesis of the documents found on futsal at school age

Categories	Number of articles	Authors and year
Physical condition, body composition, diet and nutrition in schoolchildren who practice Futsal	22	Amani-Shalamzari et al. (2019); Arroyave, Burgos & Ríos (2019); Bilhalva & Coswig (2017); Cunha Voser et al. (2018); da Rocha Silva, de Souza, de Lima Pinto & Alves (2019); Da Silveira et al. (2017); de Abrão et al. (2017); de Macêdo, da Costa Machado, Silva & Navarro (2017); de Souza, Cruz & Rocha (2018); dos Santos et al. (2015); García-Jiménez & Martínez (2019); Junior et al. (2017); Nakamura et al. (2016); Oliota-Ribeiro et al. (2018); Rodrigues et al. (2016); Seabra et al. (2017); Souza et al. (2019); Alvares et al. (2020); Aparecida et al. (2017); Batalha et al. (2019); Oliveira et al. (2019); Ribeiro et al. (2015)
Motor skills in schoolchildren who practice Futsal	17	Aguirre, Chaves & Franken (2019); da Silva, Ceconi & Fonseca (2017); da Silva Luz et al. (2019); de Oliveira et al. (2017)*; Dobrowoski, dos Santos Duarte, Marques & da Cunha Voser (2018); Ferreira, Alves & Silva (2017); Freitas (2015); Machado Filho, (2018); Soares et al. (2016); Travassos, Araújo & Davids (2018); Vidmar & Moraes (2016); Waltrick & Dos Reis (2016); Alves Alves (2016); Brandao et al. (2016); Caglayan et al. (2018); Campos et al. (2015); González-Víllora et al. (2019)
Motivations for practicing Futsal	11	Alves (2015); de Oliveira et al. (2017)*; Diehl & de Souza (2018); Fonseca & Stela (2016); Kozak & da Silva Gasparotto (2018); Moraes et al. (2018); Moura (2015); Sena, Hernandez, dos Santos Duarte & Voser (2017); Voser, Hernandez, Voser & Rodrigues (2016); Voser, Moreira, Voser & Hernandez (2016); Dutra et al. (2019)
Other topics investigated (injuries and gender, types of surfaces and recovery times)	18	Abós, Sevil, García-González, Aibar & Sanz (2015); Álvarez-Kurogi, Onetti, Fernández-García & Castillo-Rodríguez (2019); Bolsonaro & Zambon (2016); da Silva Brandão, Mezzomo, Flôres & Corazza (2016); de Menezes Tavares (2015); Jorand, da Silva Triani, Murad, dos Santos & Telles (2019); Milanez et al. (2020); Miguel & Pinto (2018); Olivete et al. (2015); Santa Cruz (2018); Travassos, Coutinho, Gonçalves, Pedroso & Sampaio (2018); Yiannaki, Carling & Collins (2018); Abasov et al. (2019); Alves Navarro (2015); Amatria et al. (2016); De Jesús, Galvao (2017); Lotfi et al. (2018); Machado et al. (2018)

* Repeated studies in the different categories.

DISCUSSION

Physical condition, body composition, diet and nutrition in schoolchildren who practice Futsal

The evaluation of physical condition in sport has now become a fundamental support axis for control processes in training [18]. Some authors [5] the heart rate values indicate that both modalities, both soccer and futsal, are useful to assume adequate cardiovascular activity in the participants. Thus, other authors [19] indicated that long-term exposure to futsal can lead to an improvement in aerobic fitness and cardiac autonomic regulation, while affecting muscle power and speed performance in young players. On the other hand an investigation [20] noted that the conditioning game and the Small Sided provided a similar heart rate stimulus compared to the generic physical training program and both programs significantly improved the fitness parameters of the young Futsal players. Additionally, the game-based conditioning and Small Sided program also resulted in better technical performance, representing an effective alternative to generic physical training for the development of aerobic capacity and anaerobic power in futsal. For Oliota-Ribeiro et al. [21] futsal training and practice is effective in improving the physical conditioning of students aged 8 to 10 years. Along these lines, other research [22] showed that a higher frequency of weekly training in Futsal is associated with an improvement in the performance of cardiorespiratory fitness in adolescents.

In another study [23], the authors aimed to analyze the basic offensive tactical principles and technical efficiency of elementary school futsal players, concluding that efficiency in the execution of technical skills is associated with tactical behavior in game situations.

Despite some anthropometric differences and differences in the maximum isometric strength of the lower limbs, it can be inferred that athletes under 17 years of age have similar characteristics to those of adult athletes [24, 25] verified whether those selected for competition teams, with 3 more intense and long trainings per week, have considerable physical advantages over other school children with 2 shorter and less intense trainings per week. These authors indicated that the children selected for competition teams had better physical fitness in terms of flexibility and cardiorespiratory fitness than did the students since the initiation of sport. Souza et al., [7] pointed out that during the preparation of the futsal school teams, although the students already have good levels of the physical fitness components related to health, systematic training in sport offers the possibility of optimizing these levels, raising the quality of life and well-being of professionals. For their part, some authors [15] noted that Futsal, as a high-impact, weight-bearing sport, can improve bone mass during childhood and adolescence.

Other authors [26] confirm after an 8-week interruption of Futsal training in U-17 players, total body mass increased by 2.5%, height by 1.2% and the wingspan 1.4% in Futsal players. The BMI did not change after detraining but the physical performance of the players in agility and speed did decrease. Thus, the explosive strength of the upper and lower extremities decreased by 16.7% and 5%, respectively; localized muscular endurance and flexibility decreased by 8.5% and 9.6%, respectively, and finally, cardiorespiratory fitness also decreased by 5.4% after the detraining period. In contrast, the results of other researchers [13] showed significant changes in weight and BMI after six months of intervention. Regarding total body mass, the initial sample weighed 56.16 and, at six months, had a mean of 60.21. Regarding the BMI, the group started with 20.55 and at six months, they had a BMI of 21.65. These authors verified that the group of adolescents presented changes in the anthropometric profile and did not show significant improvements in the dietary profile. The results of other authors [4] showed that 81.8% were eutrophic, in relation to BMI (20.9) and with an excellent percentage of fat (14.0). However, there was an energy deficit of 395.59 kcal compared to energy needs. Regarding macronutrients, carbohydrates were within the minimum recommended limit, protein was above the recommended limit, and lipids exceeded the recommendation. Regarding micronutrients, ascorbic acid consumed more than recommended, calcium had a deficit in intake, iron was the only micronutrient found within the recommended intake, and zinc indicated slightly deficient intake. The distortions found in the food intake demonstrate the importance of correct nutritional guidance and monitoring, so that there are no losses in relation to development and sports performance [4]. On the other hand, some investigation [11] showed that 42% of adolescents who practiced Futsal had an age-appropriate BMI, 31% were underweight, 19% were elevated, and 8% were overweight. Likewise, this study pointed out that the caloric intake is insufficient for the physical activity carried out and the

distribution of macronutrients is inadequate, which shows the importance of nutritional monitoring for the good performance and development of the adolescent athlete. Various researches [27] evaluated the nutritional status and eating profile of a school team of soccer players from the city of Caxias do Sul. The results showed that the team is eutrophic and, according to waist circumference, does not present a risk of cardiovascular diseases. The fat percentage is adequate, and the athletes have good eating habits, although the associations between the variables studied were not statistically significant.

In this way, we can conclude that the food consumption present in athletes in the Under-13, Under-15 and Under-17 categories disagrees with the nutritional recommendations. In this sense, these athletes are likely to have performance losses [28]. For other authors [12] these results reinforce the importance of nutritional monitoring of adolescent athletes. Another study [2] indicated that students who practice Futsal had moderate nutritional knowledge and that eating is influenced by academic activities. In this sense, a good performance in training and competitions requires an active and healthy life, with adequate nutrition, training and rest periods. In other study [29] concluded that in relation to the anthropometric profile of the athletes, only 42% is adequate for age and the caloric intake is insufficient for physical activity performed. And with an inadequate macronutrient distribution, demonstrating the importance of nutritional monitoring, for a good performance and development of the adolescent athlete.

In the field of body changes during puberty, a literature review has been found on how these changes affect the performance of young futsal players [30], confirming the need for specific training of certain components in the field of physical condition and psychomotor skills, to achieve greater sports performance.

Other researchers [31] it was attempted to correlate and calculate predictive equations for different physical fitness variables in intermittent effort protocols in a sample of 18 adolescent futsal players. It was concluded that maximum aerobic power and performance in triple horizontal jump can determine and even predict the ability to repeat sprints.

Motor skills in schoolchildren who practice Futsal

The specific practices of sports related to Futsal are presented as important to improve the motor skills of students [8]. One study [32] indicated that of the students who do not practice Futsal, 9.1% were classified with normal coordination, 27.3% with insufficient coordination and 63.6% with impaired motor coordination. However, in the classification of students who practice the Futsal modality, 54.5% had normal coordination and 45.5% had alterations in coordination and motor development. Following these contributions, other authors [3] found that the group that practiced Futsal was superior in most of the motor issues of motor coordination, laterality and temporal structure, when comparing schooling in the laterality component, the second and third year of Futsal practice. Another study [33] aimed to investigate motor coordination and motivational aspects related to the practice of sport in schoolchildren who enter a futsal project. Motor coordination among students is very similar, which shows that age for this group was not an intervening factor, although the older students showed more coordination. When the entire sample was analyzed and classified, it was found that 58.1% of the students presented normal coordination, however approximately 42% showed alterations and insufficient coordination.

On the other hand, the results of another research [34] showed that 79.06% of children and adolescents had a level of motor coordination considered normal. It is concluded that the frequency of training, in elementary students and futsal school practitioners, influences the performance of the lower limbs that imply agility tests, and that the practice of the specific sport influences the performance of the lower limbs that involve jumping [35]. In other study [36] regarding the coordination with the ball of children in the four skills, it was identified that in the tasks performed with the hands the results presented were superior to those of the tasks performed with the feet. The results indicate that in all tasks there was a significant difference in the level of motor coordination before and after futsal training. In a sample of 22 children, they studied the level of development of motor coordination as a prerequisite for learning sports skills, all showing improvements after 15 training sessions [37].

One study [38] analyzed in a sample of 24 children the control group and 24 experimental group the effect that training with a futsal ball produces on sports performance, they concluded that training with heavier and less bouncing futsal balls increases contact with the ball which results in an improvement in your playing skills and also has a positive.

Other authors [39] concluded that young people who were in the stages of greater maturity had a greater body mass and height in relation to those who were younger but, on the other hand, did not present significant differences in most comparisons between motor performance variables. The exception was for the long jump variable, where the differences between the oldest stages were significant. The results obtained in another investigation [40] showed a good body composition in their sample, but, nevertheless, the physical capacities showed values much lower than expected. Thus, there is a need to add specific work of strength, speed and flexibility to the macro training cycle to improve these physical capacities and, consequently, improve sports performance. For their part, other authors [41] pointed out that the age range and practice time of students in the futsal modality can interfere with the level of learning and, consequently, in the performance of motor skills of the technical foundations of children in the first years of primary school.

The complementary nature of the two sports can be exploited for early diversification skill acquisition by emphasizing selected performance-based benefits, behavioural correspondence between the sports, and evident progress toward task goals. By starting futsal at an early age, future soccer players will have the opportunity to explore the tactical behaviours of futsal, which will enrich their developing perceptual-motor landscape. To ensure a complementary transfer of skills between sports, training interventions should highlight information limitations to improve the coupling of perception and action in futsal and soccer players [42]. In view of technical development, there is a need to use the fundamentals of motor learning, primarily in terms of structuring practice, providing feedback, modeling, and goal setting. As for tactical development, it is necessary to provide tactical assumptions to allow the student to perceive and make decisions in the face of different problematic situations in the game. Regarding the teaching methodologies in futsal, there is a current concern to use different methodologies depending on the needs of the child or the team [14]. Various authors [43] established specific tests through a motor skills championship for the analysis of the performance of 33 children who practice futsal in order to improve the selection processes of players with motor potential.

In other investigation [44] studied the importance of the demonstration of different specific motor skills in futsal in children. Other authors [45] demonstrate in his results that both physical (e.g., distance covered) and physiological performance (e.g., Edwards' TRIMP) are significantly higher during Contextualized Sport Alphabetization Model (CSAM) in contrast to Teaching Games for Understanding (TGfU). Moreover, relationship between physical and physiological variables help teachers to adapt sessions to the features of the context.

Motivations for practicing Futsal

For Moura [46] there are several factors that influence the initiation, learning and performance of the child in futsal. In this research indicated that 58% of the children began practicing Futsal between the ages of 7 and 10, 84% started futsal because they like it, 79% said that their parents encouraged them to play, and 63% of the athletes interviewed say that futsal is more enjoyable in competition. 53% want to perfect their techniques in futsal to be a footballer, 58% of athletes feel more anxious in the game, and 53% are afraid of making mistakes during the game, 58% of athletes say that fans make them more nervous during the game.

Other authors [47] analysed the motivational factors that lead children to practice futsal and observed that health was the main reason that led children to practice Futsal and, as secondary reasons, sports competition, the friendship factor and leisure. Following these contributions, some authors [48] showed that the older the age, the less relevant the friendship and leisure factor becomes for the practice of futsal. For Alves [49], the greater involvement of adolescents in sports is due to the intrinsic characteristics of this age group, since the reasons considered most important in this study were to develop skills, exercise, maintain health and have fun. Regarding motivation to practice sports, other authors [33] found no significant differences between the groups, but significant correlations were found between some motivational dimensions. The main motivation of the children who practice

Futsal was for the fun of the group activity and also, in other cases, the influence of the family members turned out to be greater for the group of 14 to 16 years. On the other hand, the results of another investigation [50] showed that the factors health, affiliation, and technical improvement were the most important, followed by physical conditioning, state and energy release. Following this line, other research [51] indicated that, for men, health and affiliation are the most important reasons and for women, health and technical improvement.

On the other hand, some authors [9] showed that mothers and fathers have different expectations regarding the participation of their children in sport, with respect to sports competition and that fathers and children differ in different aspects (sports competition, health, friendship and leisure) regarding the sports motivation of their children. Fonseca & Stela [52] identified the parental factors that determine children's participation in competitive futsal. The results showed that sport is valued by parents. Likewise, this study concludes that the parental incentive creates a healthy environment for the child to develop their potential, safety and motivation to practice futsal and that there is no significant difference in behaviour between mothers and fathers. For other authors [53] the participation and involvement of collaborating parents in the sport that their children practice is extremely positive and the parents' perspective is that children continue to practice sports in a way that brings them happiness, learn to face the adversities of work in a group, and finally, that they participate in more competitions.

Some authors [54] identified the motivational factors for the practice of futsal in children and adolescents from 8 to 14 years old in environments with different didactic purposes, confirming that these factors depend on the teaching environment, which could improve sports learning.

Other topics investigated

On the other hand, there are other research topics related to Futsal. Thus, there are authors [6] who observed that training with reduced games can be effective to improve various technical and tactical components in collective sports games, especially in futsal. There are researchers who analyzed [55] the effectiveness of different reduced game formats by creating a multiple logistic regression model to predict the success of offensive movements based on the game format and the area of the field in which the movement began. In another investigation [56] the hours of sleep in young Futsal practitioners were studied. Data from these authors indicated that young people slept an average of 7.3 hours of night time sleep, and 42% indicated that they slept during the day. 96.5% and 95% of the youngsters reported no insomnia after the game and after training. It can be concluded that the recommendations and instructions of sleep become part of the training routines of young futsal practitioners.

For their part, other authors [57] indicated that 86% of the children who practice Futsal have a high level of anxiety and that it was manifested to a greater extent in the infantile category, due to the changes from the phase pubescent and the relationship with the heterogeneity of the maturity levels of each individual, directly influencing their performance. Some authors [58] pointed out that stress control and other psychological characteristics influence sports performance. The main findings of these authors revealed that the psychological characteristics and the profile related to sports performance in promising young futsal players are different according to the playing position and suggest the inclusion of psychological training programs in order to improve the psychological abilities of the players, especially for players with an offensive role who seek to score goals. For their part, other research [59] analysed the ways in which parental violence is manifested during sub-9 futsal matches and indicated that the two forms of manifestation of the violence in parent fans goes against the values of amateur sport and ends up giving rise to dysfunctional behaviours in children.

Some authors [1] found that in schools the Futsal teaching process is based on the most recent theories about initiation to futsal, demonstrating a good quality of coaches and coordinators. Another research [60] found that 78% of coaches prefer to adopt a mixed method between the global method and the analytical method as a starting point for Futsal, although in the analytical method the greatest difficulty observed by teachers is the disinterest of students for being a method of repetitive exercises. Coaches are concerned with choosing teaching methods that include the participation of boys and girls, including materials and respecting the development and characteristics of each student at the expense of early specialization [60]. Thus, participation is a first step in helping football coaches to understand

the potential returns to learning to develop talent detection programs [61]. According to other research [62] coaches can use one goal to promote the irregularity of the players' movement and two goals to increase team dispersion, mainly in the younger age groups that tend to crowd around the ball. Player substitution is an important strategy that coaches should use to improve running and passing performance in futsal.

The teaching of futsal to children during Physical Education classes was also the subject of research, thus a study confirms the relationship between what happens in the classroom and outside of it, being necessary for Physical Education teachers to create a supportive climate to the basic psychological needs in each of the curricular contents, with the aim that students adopt more active and healthy lifestyles [63]. Other authors [64] showed advantages in the use of physical demonstration with examples during School Physical Education classes, highlighting the importance of using appropriate methods for teaching futsal.

But the research on school futsal also brings together some articles related to children with disabilities or motor impairments. A study [65] showed how through indoor soccer a sample of children with motor problems improved their psychomotor profile.

On the other hand, there are several studies that analyzed the training profile of coaches, referees and also the effects of stretching before the training session. Thus one research [66] analyzed the knowledge of the futsal coaches of the sports schools of children from 6 to 10 years old, inquiring if there was planning, evaluation and correct methodological work. Other researchers [67] addressed the profile of the referees in children's futsal, concluding that 42.85% had the highest level of studies in high school, all had an official referee course and 92.85% stated that they were a referee by vocation. 85.71% believe that they do not need specific training to referee children's matches. Other authors [68] investigated the effects of stretching before intense exercise in 12 adolescent futsal practitioners, the results indicate that stretching before intense training reduces cell damage and the side effects of physical training on hematological factors.

And finally an investigation focused on the analysis of body image and gross praxia confirms the impact of a program of 18 futsal sessions in children aged 8-12 years, confirming improvements in gross praxia and body image in children [69].

CONCLUSIONS

After the analysis of the 68 definitive articles for this systematic review on futsal research in children and adolescents from 2015 to August 2020, it is concluded that if any reader wants to delve into one or more of these categories, in this article they have the evidence in a summarized and global way, as well as a valuable compilation of the references at your disposal. Also highlighting the following findings:

1. There is a high number of publications related to school futsal for sports performance purposes.
2. There is a scarce number of publications that address school Futsal with an educational approach and as a means to promote a healthy lifestyle from childhood.
3. Studies on childhood, adolescence, youth and futsal have not sufficiently studied the important role that parents play in promoting healthy habits, the importance of families and educators and / or coaches in promoting fair play. In other words, sport and futsal as an added value to promote the values of education and respect beyond the competitive aspects at these ages.
4. Aspects such as the violence generated by some parents on the playing fields where their children train and practice Futsal have not been studied in depth.
5. Most of the investigations found have focused on the Spanish context and, especially, on the Brazilian one where there is a great passion for this sport.
6. A large majority of the works have focused on the analysis of technique, tactics and sports performance in school futsal.
7. Very few studies have been found on women and soccer or on the importance of the sports coach as an educator in these school categories, as well as the role of the referee.

REFERENCES

1. Olivete BD, Legnani E, Fernandes GJ, da Rosa GJ, Pires LM, Guimarães RBC, Carvalho WG. Pressupostos teóricos que orientam o trabalho prático dos treinadores de escolas de iniciação de Futsal. [Theoretical assumptions that guide the practical work of coaches in Futsal initiation schools] *Revista Brasileira de Futsal e Futebol* 2015; 7(27): 467-473. [In portuguese] doi: 10.11606/d.59.2018.tde-19042018-094029
2. da Cunha Voser, R., dos Santos Cunha, G., Marques, P. A., dos Santos Duarte, M. A., Aimi, G. A., & Hein, A. P. Conhecimento nutricional, perfil alimentar e estado nutricional de jogadores universitários de Futsal [Nutritional knowledge, food profile and nutritional status of university Futsal players]. *Revista Brasileira de Nutrição Esportiva* 2018; 12(71): 394-403. [In portuguese] doi: 10.4034/rbcs.2011.15.04.01
3. da Silva Luz MF, Ribeiro HL, Soares V, Santos MM, Pereira FA, da Rocha VHM, Venâncio PEM. Psychomotor level of children practicing Futsal and a social project in the city of Anápolis-GO. *Revista Brasileira de Futsal e Futebol* 2019; 11(43): 273-278. [In portuguese] doi: 10.12957/rdc.2019.36391
4. dos Santos MSL, Gomes JS, Biesek S. Avaliação do perfil antropométrico e consumo alimentar adolescentes jogadores de futsal [Evaluation of the anthropometric profile and food consumption of adolescent futsal players]. *RBNE-Revista Brasileira de Nutrição Esportiva* 2015; 9(53): 463-470. [In portuguese] doi: 10.1590/1517-869220152106138411
5. García-Jiménez JV, Martínez AJA. Fútbol vs. Fútbol sala. Frecuencia cardíaca y contactos con balón en jugadores de categorías inferiores. *Revista Internacional de Deportes Colectivos* 2019; 37: 5-22. doi: 10.5232/ricyde2011.02201
6. Miguel H, Pinto JGV. Os jogos reduzidos no futsal e sua influência em ações táticas e técnicas em alunos da categoria sub 13 [Reduced games in futsal and its influence on tactical and technical actions in under 13 category students]. *Revista Brasileira de Futsal e Futebol* 2018; 10(39): 455-461. [In portuguese] doi: 10.11606/d.100.2019.tde-15052019-111356
7. Souza LMV, Fiorillo RG, Fonseca HS, dos Santos SR, dos Santos JL, Santos PMF, do Nascimento MA. Análise da composição corporal e de níveis de aptidão física de escolares praticantes de Futsal em relação aos índices sugeridos pelo projeto esporte Brasil (PROESP-BR) em fase preparatória para competições escolares [Analysis of body composition and physical fitness levels of schoolchildren practicing Futsal in relation to the indices suggested by the sports project Brazil (PROESP-BR) in the preparatory phase for school competitions]. *Revista Brasileira de Futsal E Futebol* 2019; 11(44): 375-381. [In portuguese] doi: 10.1590/s1517-86922011000300001
8. Machado Filho R. Efeitos de um treinamento físico sobre a aptidão física de escolares praticantes de futsal da cidade de Niterói-RJ [Effects of physical training on the physical fitness of schoolchildren practicing futsal in the city of Niterói-RJ]. *Revista Brasileira de Futsal e Futebol* 2018; 10(39): 462-466. [In portuguese] doi: 10.33233/rbfe.v6i1.3508
9. Kozak JCP, da Silva Gasparotto G. Análise motivacional da prática de futsal em crianças de 3 a 7 anos de idade e das expectativas dos pais. *Revista Brasileira de Futsal e Futebol* 2018; 10(39): 421-427. doi: 10.22478/ufpb.2316-9923.2017v6n2.32445
10. Arufe-Giráldez V, Barcala-Furelos R, Mateos-Padorno C. School Sport Programs in Spain and the Participation of Theeducational Personnel. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte* 2017; 17(67): 397-441. doi: 10.15366/rimcafd2017.67.001
11. de Abrão TCA, dos Santos Toriani S, de Almeida PHF. Perfil nutricional de adolescentes jogadores de Futsal de Joinville-SC. *RBNE-Revista Brasileira de Nutrição Esportiva* 2017; 11(66): 676-681
12. Da Silveira MA, Rombaldi AJ, Coswig VS. Efeitos de uma intervenção alimentar em atletas de futsal de diferentes categorias etárias. *Revista Brasileira de Futsal e Futebol* 2017; 9(32): 70-76
13. Rodrigues B, Spuldaro LI, Biesek S. Intervenção nutricional em atletas adolescentes praticantes de Futsal de uma Associação Atlética de Curitiba-PR. *Revista Brasileira de Nutrição Esportiva* 2016; 10(56): 126-135
14. Waltrick RD, dos Reis MA. Iniciação e formação de atletas em futsal-desenvolvimento técnico-tático e metodologias de ensino. *Revista Brasileira de Futsal e Futebol* 2016; 8(31): 302-312
15. Seabra A, Fernandes RJ, Marques E, Moura M, Ubago-Guisado E, Hernando E, Gallardo L. Impact of Futsal and Swimming Participation on Bone Health in Young Athletes. *Journal of Human Kinetics* 2017; 60(1), 85-91. doi: 10.1515/hukin-2017-0092
16. Arufe Giráldez V. How should Physical Education work in Early Childhood Education be?. *Retos* 2019; 37(37): 588-596. doi: 10.47197/retos.v37i37.74177
17. Grant MJ, Booth A. A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal* 2019; 26(2): 91-108. doi: 10.1111/j.1471-1842.2009.00848.x

18. Arroyave HDC, Burgos HYC, Ríos GAV. Potencia anaeróbica láctica en jugadores de Fútbol sala universitario. *Revista Brasileira de Futsal e Futebol* 2019; 11(42): 82-89
19. Nakamura FY, Pereira LA, Cal Abad CC, Kobal R, Kitamura K, Roschel H, Loturco I. Differences in physical performance between U-20 and senior top-level Brazilian futsal players. *Journal of Sports Medicine and Physical Fitness* 2016; 56(11): 1289-1297
20. Amani-Shalamzari S, Khoshghadam E, Donyaei A, Parnow A, Bayati M, Clemente FM. Generic vs. small-sided game training in futsal: Effects on aerobic capacity, anaerobic power and agility. *Physiology & behavior* 2019; 204: 347-354. doi:10.1016/j.physbeh.2019.03.017
21. Oliota-Ribeiro LS, Macedo JOR, Macedo RM, Bezerra AS, Neto LGH, Nascimento, MA. Effect of futsal training on cardiorespiratory resistance in children. *Motricidade* 2018; 14(S1): 97-103.
22. da Rocha Silva FC, de Souza EA, de Lima Pinto JCB, Alves FR. Aptidão física relacionada ao desempenho em adolescentes praticantes de futsal. *Revista Brasileira de Futsal e Futebol* 2019; 11(43): 257-262.
23. Oliveira Silva GH, Marques PG, Codonato R, Borges PH. Analysis of the execution of defensive tactical principles between futsal practice school children. *Revista Brasileira de Futsal e Futebol* 2019; 11(45): 490-496
24. Junior MAF, Esteves JVDC, de Moraes SMF, de Souza EA, de Moraes ADJP, Andreato LV. Comparison of anthropometric and physical profiles of futsal athletes from under-17 and adult categories. *Sport Sciences for Health* 2017; 13(1): 107-112. doi: 10.1007/s11332-016-0317-6
25. Bilhalva FB, Coswig VS. Relação alto desempenho e escolinha no futsal entre jovens de 12 e 13 anos. *Revista Brasileira de Futsal e Futebol* 2017; 9(32): 53-58
26. de Souza MP, Cruz RM, Rocha RER. Efeito do destreinamento sobre as características antropométricas e desempenho físico em jogadores de Futsal Sub-17. *Revista Brasileira de Futsal e Futebol* 2018; 10(40): 604-611
27. Batalha TB, Gottardo FM, Conde SR, Alves MK. Nutritional status and food profile of a female futsal school team from Caxias do Sul-RS municipality. *Revista Brasileira De Nutricao Esportiva* 2019; 13(79): 378-383.
28. de Macêdo MR, da Costa Machado JC, Silva AJS, Navarro AC. Perfil alimentar de atletas de futsal nas categorias sub-13, sub-15 e sub-17. *Revista Brasileira De Prescrição E Fisiologia Do Exercício* 2017; 11(67): 498-503
29. de Abrao A, Thais C, Toriani SdS, de Almeida F, Henrique P. Nutritional profile of adolescents futsal players from Joinville. *Revista Brasileira De Nutricao Esportiva* 2017; 11(66): 676-681
30. Alvares PD, Chaves PJ, de Oliveira Junior, Mario Norberto Sevilio, Banja Fernandes TL, Veneroso CE, Torres Cabido CE. Effects of Puberty on Jump and Sprint Performance in Young Futsal Players. *Revista Brasileira De Medicina do Esporte* 2020; 26(2): 167-171
31. Ribeiro YS, Balhego LL, Vecchio FBD. Aerobic power and jumps predict performance in intermittent running test in young indoor soccer players. *Revista Brasileira de Cineantropometria Desempenho Humano* 2015; 17(3): 357-366
32. Freitas F. A influência do futsal no desenvolvimento motor em adolescentes de 13 e 14 anos. *Revista Brasileira de Futsal e Futebol* 2015; 7(24): 158-164.
33. de Oliveira VM, da Silva TR, Brasil MR, Estevão BJ, Chumlhak Z, da Silva SR. Nível de motivação e coordenação motora em escolares ingressantes em um projeto de futsal. *Revista Brasileira de Futsal e Futebol* 2017; 9(32): 42-52. doi: 10.17058/cinergis.v16i2.5603
34. da Silva, DM, Ceconi, J, Fonseca, GMA coordenação motora dos jovens goleiros de Futsal. *Revista Brasileira de Futsal e Futebol* 2017; 9(33): 105-112
35. Vidmar MF, Moraes D. Performance funcional dos membros inferiores de escolares do Ensino Fundamental e praticantes de escolinhas de Futsal. *Revista Brasileira de Futsal e Futebol* 2016; 8(31): 319-325
36. Soares GF, da Silva Reis M, da Silva SA, Braga WMC, da Silva Moura S, Beltrame TS. Coordenação com bola de crianças e jovens que treinam futsal no Ouro Preto tênis clube. *Revista Brasileira de Futsal e Futebol* 2016; 8(30): 248-255. doi: 10.1590/s0101-32892013000100002
37. Campos Aburachid LM, da Silva SR, Claro JdN, Greco PJ The motor coordination level after a program of futsal training. *Revista Brasileira De Futsal E Futebol* 2015; 7(23): 25-34
38. Caglayan A, Erdem K, Colak V, Ozbar N. The Effects of Trainings with Futsal Ball on Dribbling and Passing Skills on Youth Soccer Players. *International Journal of Applied Exercise Physiology* 2018; 7(3): 44-54
39. Dobrowoski M, dos Santos Duarte MA, Marques PA, da Cunha Voser RA maturação biológica, aptidão física e crescimento: estudo de jovens escolares, praticantes de Futsal do sexo masculino, com idades entre 11 e 15 anos. *Revista Brasileira de Prescrição e Fisiologia do Exercício (RBPFE)* 2018; 12(73): 247-255doi: 10.33233/rbfe.v9i2.3474

40. Ferreira JF, Alves BP, Silva DAG. Análise do perfil antropométrico e de desempenho motor de atletas Juatubenses de futsal sub 17. *Revista Brasileira de Futsal e Futebol* 2017; 9(32): 59-63. doi: 10.5007/1980-0037.2008v10n1p76
41. Aguirre PF, Chaves PM, Franken M. Comparação do desempenho de fundamentos técnicos em crianças de diferentes faixas etárias no Futsal. *Revista Brasileira de Futsal e Futebol* 2019; 11(42): 105-110
42. Travassos B, Araújo D, Davids K. Is futsal a donor sport for football?: exploiting complementarity for early diversification in talent development. *Science and Medicine in Football* 2018; 2(1): 66-70. doi: 10.1080/24733938.2017.1390322
43. Alves I, Alves C, Leque E, Lima W, Pereira R, Scorcine C et al. Championship specific skills in futsal. *Revista Brasileira de Futsal e Futebol* 2016; 8(30): 215-219
44. Brandao M, Mezzomo SP, Flores FS, Corazza ST. Improvement statement of use performance motor boys in skills of futsal. *Revista Brasileira de Futsal e Futebol* 2016; 8(31): 334-339
45. Gonzalez-Villora S, Jacob Sierra-Diaz M, Carlos Pastor-Vicedo J, Ricardo Contreras-Jordan O. The Way to Increase the Motor and Sport Competence Among Children: The Contextualized Sport Alphabetization Model. *Frontiers in Physiology* 2019; 10: 569
46. Moura IS. Fatores que interferem na iniciação do Futsal nas categorias de base sub 9 e sub 11. *Revista Brasileira de Futsal e Futebol* 2-15; 7(26): 425-429
47. Diehl AA, de Souza RM. Os fatores motivacionais no Futsal: estudo realizado com crianças de um projeto social de Futsal no município de Lindolfo Collor-RS. *Revista Brasileira de Futsal e Futebol* 2018; 10(39): 445-454. doi: 10.1590/s0101-32892013000100014
48. Sena AC, Hernandez JAE, dos Santos Duarte MA, Voser RDC. Fatores motivacionais que influenciam na prática do Futsal: um estudo de uma escolinha na cidade de Porto Alegre. *Revista Brasileira de Futsal e Futebol* 2017; 9(35): 416-421. doi: 10.11606/d.74.2019.tde-24042019-100846
49. Alves FR. Fatores motivacionais para a prática do Futsal em adolescentes entre 11 e 17 anos. *Revista Brasileira de Futsal e Futebol* 2015; 7(27): 579-585
50. Voser RDC, Moreira CM, Voser PEG, Hernandez JAE. A motivação para prática do Futsal: Um estudo com atletas na faixa etária entre 13 e 18 anos. *Revista Brasileira de Futsal e Futebol* 2016; 8(28): 39-45
51. Voser RDC, Hernandez JEA, Voser PEG, Rodrigues TA. Motivação dos praticantes de futsal universitário: um estudo descritivo. *Revista Brasileira de Futsal e Futebol* 2016; 8(31): 357-364
52. Fonseca GM, Stela ESA influência parental na participação dos filhos no Futsal competitivo. *Revista Brasileira de Futsal e Futebol* 2016; 8(28): 3-12
53. Moraes DD, Duarte Junior MA, Ginciene G, Moraes JC, dos Santos Cunha G, Da Cunha Voser R. A perspectiva dos pais em relação à participação esportiva dos filhos em uma escolinha de Futsal. *Revista Brasileira de Futsal e Futebol* 2018; 10(39): 481-491. doi: 10.22533/at.ed.5151901107
54. Dutra G, Alcantara CH, Pereira Santana IA, Turnes T. Motivational factors for futsal practice in children and adolescents in environments with different teaching purposes. *Revista Brasileira De Futsal e Futebol* 2019; 11(45): 483-489
55. Amatria M, Lapresa D, Arana J, Teresa Anguera M, Garzon B. Optimization of Game Formats in U-10 Soccer Using Logistic Regression Analysis. *Journal of Human Kinetics* 2016; 54(1): 163-171
56. Santa Cruz RAR. Caracterização do padrão de sono de jovens atletas de futsal. *Revista Brasileira de Futsal e Futebol* 2018; 10(38): 359-364
57. de Menezes Tavares F. Influência dos níveis de Ansiedade em diferentes categorias do Futsal Escolar. *Revista Brasileira de Futsal e Futebol* 2015; 7(27): 462-466
58. Álvarez-Kurogi L, Onetti W, Fernández-García JC, Castillo-Rodríguez A. Does the psychological profile influence the position of promising young futsal players? *PloS One* 2019; 14(11): e0224326. doi: /10.1371/journal.pone.0224326
59. Jorand MF, da Silva Triani F, Murad M, dos Santos RF, Telles SD. A violência em categorias de base do futsal no Rio de Janeiro: um mergulho no universo dos pais e treinadores. *Movimento* 2019; 25: 25036. doi: 10.22456/1982-8918.89364
60. Bolsonaro JR, Zambon SG. A iniciação do futsal nas escolas de Ensino Fundamental II em Monte Alto-SP. *Revista Brasileira de Futsal e Futebol* 2016; 8(31): 326-333
61. Yiannaki C, Carling C, Collins D. Futsal as a potential talent development modality for soccer—a quantitative assessment of high-level soccer coach and player perceptions. *Science and Medicine in Football* 2018; 2(4): 299-308. doi: 10.1080/24733938.2018.1483079
62. Milanez VF, Bueno MJDO, Caetano FG, Chierotti P, de Moraes SMF, Moura FA. Relationship between number of substitutions, running performance and passing during under-17 and adult official futsal matches. *International Journal of Performance Analysis in Sport* 2020; 1-13. doi: 10.1080/24748668.2020.1761673

63. Abós A, Sevil J, García-González L, Aibar A, Sanz M. Experiencias positivas en Educación Física a través de la intervención docente en el contenido de fútbol sala. *Sportis Scientific Technical Journal* 2015; 1(5): 220-238. doi: 10.17979/sportis.2015.1.3.1415
64. da Silva Brandão M, Mezzomo SP, Flôres FS, Corazza ST. Uso de demonstração melhora a performance motora de meninos em habilidades do futsal. *Revista Brasileira de Futsal e Futebol* 2016; 8(31): 334-339
65. Abasov RGO, Gorelik VV, Filippova SN, Belyaev VS. Optimization of Rehabilitation Effects of Futsal as Part of Comprehensive Correctional and Developmental Program on the Motor, Regulatory and Adaptation Potential of Boy at the Age Of 10-12 With ICP. *International Journal of Applied Exercise Physiology* 2019; 8(3): 115-128
66. Alves AR, Navarro AC. Using methodology for teaching-learning in schools of futsal with children aged between 6 to 10 years. *Revista Brasileira De Futsal E Futebol* 2015; 7(27): 474-494
67. de Jesus RJ, Galvao de Miranda, Bruno Luiz, Barros da Silva, Diogo Matheus, Caldas EdS, Pestana ER, de Araujo ML. Study about the referees' vision regarding their performances in the School Games of Maranhao 2014 in the infantile category of futsal sport. *Revista Brasileira De Futsal E Futebol* 2017; 9(35): 422-428
68. Lotfi N, Mohamadi S, Mirzaei-Takmil M. Effects of stretching before intense exercise training on hematologic and cellular injury indices. *Pedagogics Psychology Medical-Biological Problems of Physical Training and Sports* 2018; 22(6): 301-305
69. Machado AA, Bezerra IS, Ponciano K, Rica RL, Gama EF, Junior AF et al. Futsal as a strategy for the improvement of elementary abilities and for the development of the body image in children. *Motricidade* 2018; 14(2-3): 11-19