


THE IMPAIRMENT OF CHILDREN'S MOTOR DEVELOPMENT AND PHYSICAL ACTIVITY DURING THE SOCIAL ISOLATION CAUSED BY THE COVID-19 PANDEMIC: AN INTEGRATIVE REVIEW

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ABSTRACT

The pandemic caused by the new coronavirus (SARS-CoV-2) and the need for the population to maintain social distancing due to the high degree of contagion, has caused social and economic changes around the world. The school is a support for the development of children and adolescents, who in a pandemic situation and social isolation, may have their developmental levels seriously compromised. The objective was to analyze publications that evaluated motor impairment and the level of physical activity in children during the social isolation of the COVID-19 pandemic. This is an integrative literature review study. The search in the databases resulted in a total of 10 articles found, which after reading the titles and abstracts, 4 articles were selected, however, 2 were included in the discussion of the work because they answered the objective of the research. The social isolation resulting from the COVID-19 pandemic negatively impacted the physical activity routine of children, thus bringing several physical and mental consequences, such as a sedentary lifestyle and delayed motor development.

Keywords: Motor Development. Physical Activity. Children. Pandemic.

INTRODUCTION

The pandemic caused by the new coronavirus (SARS-CoV-2) and the need for the population to maintain social distancing due to the high degree of contagion, has caused social and economic changes around the world.

The suspension of face-to-face classes in schools was a strategy used as a way to prevent children and adolescents from becoming vectors of contamination. In Brazil, schools started to adopt emergency remote education in order not to interrupt the school year (Hodges *et al.*, 2020), so students and teachers in social isolation also had to deal with anxieties and fragilities arising from the loss of a routine, the accumulation of tasks and other responsibilities (Arruda, 2020).

Despite being a necessary measure, the social isolation of children and adolescents, especially in the school context, tends to generate negative psychological effects, which can extend to physical and mental consequences in different age groups (Florêncio Júnior; Paiano; Costa, 2020).

For Lourenço, Sousa and Mendes (2019) it is likely that the increase in time spent sitting in sedentary activities in online games, watching TV and even in remote classes, consequently, will lead to a reduction in physical activity levels.

In this sense, Florêncio Júnior, Paiano and Costa (2020) warn that sedentary behavior can negatively affect brain structures in overweight/obese children. Cruz *et al.* (2017) observed that the greater the children's involvement in active behaviors, the more they built a motor repertoire sufficiently adapted to specific movement contexts. In contrast, limited physical activity may contribute to impaired motor coordination.

This motor development (DM) is understood by Neto (2002) as the continuous process that refers to the results of the interaction between environmental and biological conditions of the child and chronological age. As a result, living organisms are always developing, but the amount of change can be more or less observable in the various periods of life.

The school is a support for the development of children and adolescents, who in a pandemic situation and social isolation, may have their developmental levels seriously compromised. Thus, those who do not master the basic motor patterns will have difficulty in specializing them, that is, they will have difficulty integrating the Fundamental Motor Patterns into specific movements. In this sense, the objective of the study was to analyze

publications that evaluated motor impairment and the level of physical activity in children during the social isolation of the COVID-19 pandemic.

THEORETICAL FRAMEWORK

MOTOR DEVELOPMENT OF CHILDREN

Motor development is one of the most important processes in a human being's life. According to FIOCRUZ (2018), motor development is associated with changes in the child's posture, behavior, and age, so motor changes go through complex processes interconnected with the growth and development of the body's systems and the maturation of the apparatus. In line with this thought, Haywood and Getchell (2004, p.344) report that motor development is considered a sequential, continuous process related to chronological age, through which the human being acquires an enormous amount of motor skills, which progress from simple and disorganized movements to the execution of highly organized and complex motor skills.

Early childhood, which covers the age between zero and five years, is the phase where the child is most receptive to stimuli from the environment and the development of motor skills occurs very quickly. (FIOCRUZ, 2018). Early motor developments are crucial in determining how the child will enhance his cognitive skills, interaction, and affection that will reflect in the future. By achieving good motor control, the child will build the basic notions for his intellectual development. Therefore, the fact of providing the greatest number of motor and psychosocial experiences to children will prevent them from presenting impairment of school skills (Batistella, 2001).

Child development begins in uterine life, with physical growth, neurological maturation, the construction of skills related to behavior and the cognitive, affective and social spheres (FIOCRUZ, 2018). The movements achieved in the child's initial phase have repercussions on motor development in adolescence, being characterized as basic movements that may vary according to each individual. It is important to emphasize that contemporary childhood is constituted in a particularly complex and plural way. Children participate in different family formations and are inserted in different contexts and cultures, concomitantly, especially with the advent of the Internet and the advanced process of media globalization (Jorosky; Barros, 2020).

For Verderi (1999, p.188) and Ferreira (2000) the motor skills that the child acquires in this phase will be improved and will become basic skills in adolescence and adulthood;

thus, if the child is little stimulated or has any developmental deficiency during the first years, this will reflect on adult life. In the school context, the practice of motor education has an influence on the development of children with school difficulties, such as problems with attention, reading, writing, calculation, and socialization (Gregório *et al.*, 2020).

In this sense, with the measure of social isolation due to the COVID-19 pandemic, it is undoubtedly that the motor development of children and adolescents in this period will be affected due to physical inactivity. Lee; De Sousa and Mendes (2019) state that, in fact, it is likely that young people will spend more time sitting in sedentary activities in online games, watching TV and even in remote classes, which, consequently, will lead to a reduction in physical activity levels.

SOCIAL ISOLATION AND THE IMPORTANCE OF PHYSICAL ACTIVITY

Due to the COVID-19 pandemic, there was a need to implement preventive measures that would allow the population not to be so affected by this disease. Thus, one of the measures adopted was social isolation in order to prevent the proliferation of the virus and maintain control of cases, through this, the National Health Council (2020) states that considering that the fight against the COVID-19 pandemic has been more effective in countries that have sovereignty and national development as a political reference, that have complied with WHO guidelines, using methods such as mass testing, social isolation, and the use of masks by the population, as well as rapid, effective, and sustainable decision-making and actions, to meet the urgent need to preserve lives, relying on the production of technical and scientific knowledge, adjusted to the social, economic, and political needs of their people.

In this sense, several countries have adopted home-office work, closing factories, shops, offices, clubs and spaces for physical exercise, as well as suspending teaching activities (Florêncio Júnior; Praiano; Costa, 2020). One of the negative factors associated with social isolation is the insertion of media and internet instruments in the daily lives of children and adolescents due to the interference of these media in the practice of physical activities. According to Spence and Lee (2003) and Dietz Júnior and Gortmaker (1985), children spend part of their time, on average 4 to 6 hours a day, watching television, playing video games or "playing" on the computer.

In this sense, the long-term use of technological means causes a series of adverse effects in children and adolescents due to the lack of physical activities that allow the

control of problems associated with social isolation and the use of technologies in the time available. With this, Zink *et al.* (2020) reports that physical activity has a mediating role in the association between depressive symptoms and sedentary behavior, as well as, when practiced vigorously, it seems to minimize the relationships between anxiety and sedentary screen-based behavior in children and adolescents. As an alternative to reduce the effects of physical inactivity and make use of technologies, Florêncio Júnior, Praiano and Costa (2020) describe that one possibility lies in the use of exergames, virtual games with greater physical demand than traditional video games, as they can improve health by increasing levels of physical activity.

For Pereira (2020), the process of social isolation brought boredom and, in many cases, a sedentary lifestyle in children, given that many exchanged the physical activities previously practiced through playful practices and Physical Education classes for televisions, sofas, computers, tablets and cell phones, practicing activities that depend on little or no effort to be done.

From the perspective that it is necessary to work on the quality of life from childhood, Darido (2004) points out that this is necessary because these young people are increasingly sedentary due to the innovations and facilities promoted by the use of technology available in the market, which has made many dedicate a good part of their time to electronic games and the constant use of cell phones, keeping the body at rest and with the advent of the Covid-19 pandemic, these data tend to increase more and more.

MATERIALS AND METHODS

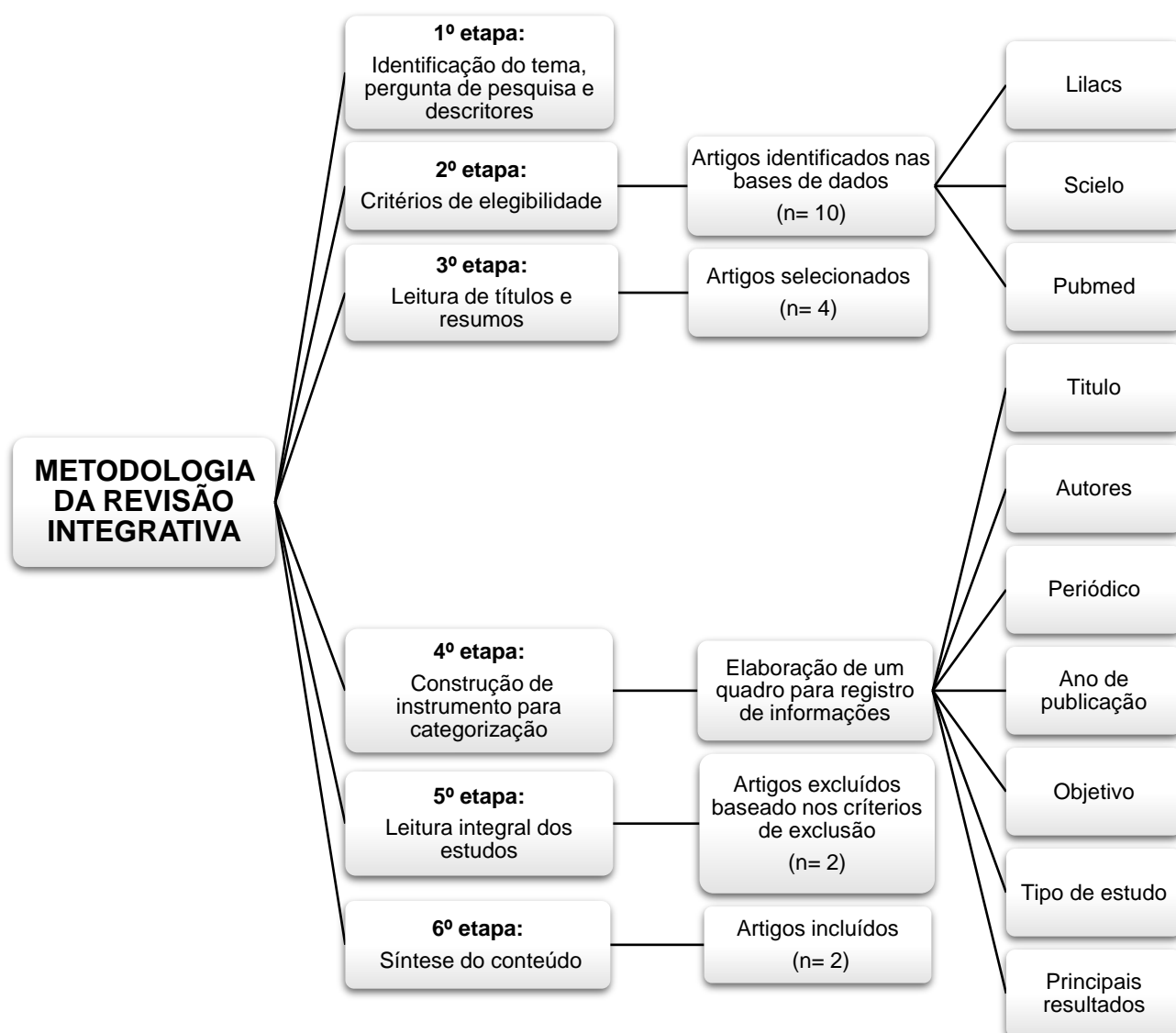
This is an integrative literature review study that, according to Santos, Brandão and Araújo (2020), is based on the ability to synthesize scientific knowledge, enabling the analysis of the knowledge produced by other authors in relation to the topic studied. For Soares *et al.* (2014), in the field of health, this type of study is based on the summarization of scientific findings, in order to identify and understand problems, situations and vulnerabilities related to the population.

For the survey of studies, the databases used were Latin American Literature in Health Sciences (LILACS), Scientific Electronic Library Online (SciELO), PubMed. The following search descriptors were used: "Physical inactivity", "Pandemic", "Physical activity", "COVID-19" and "Social isolation". To catalog the articles and later evaluate them,

a representative table of the selected research was elaborated, consisting of the title, authors, journals, year of publication, objective, type of study and main results.

As a filter for the inclusion criteria, only articles with text in Portuguese, English, and Spanish with a year of publication between 2012 and 2022 and that had children as a study group or sample were considered. Flowchart 1 presents the steps taken, in which Gil (2010) considers that in the process of elaborating an integrative review it is necessary to go through, with six distinct and sequential steps.

Flowchart 1: Steps taken in the selection of articles.



Source: Research authors

RESULTS AND DISCUSSIONS

The search in the databases resulted in a total of 10 articles found, which after reading the titles and abstracts, 4 articles were selected, however, 2 were included in the discussion of the work because they answered the objective of the research. Chart 1 lists the articles included in this study, as well as their general characteristics.

Table 1: General characteristics of the articles

Title	Authors	Newspaper	Year of publication	Type of study	Main results
Sleep, sedentary behavior, and physical activity: changes in children's routines during COVID-19	SILVA <i>et al.</i>	Rev. bras. Act. fis. health	2020	Cross-sectional study with a quantitative-qualitative approach	A reduction in the practice of physical activity (54%) was also observed among children as a result of the altered school routine with the closure of schools, since an important social environment in protecting exposure to such health prevention behaviors.
Social isolation: physical and mental consequences of physical inactivity in children and adolescents	FLORÊNCIO JÚNIOR; PAIANO; COAST	Rev. bras. Act. fis. health	2020		The results show a concern with health during social isolation, since low levels of activity physical and high screen time are associated with risks for overweight and obesity.

Source: Research authors

Sedentary behavior can also negatively affect brain structures in overweight/obese children (Florêncio Júnior; Paiano; Costa, 2020). Since the regular practice of physical activity, added to good aerobic fitness, significantly improves cognitive functions during childhood, such as better attention levels and greater speed in processing information

(Paulo *et al.*, 2019). In this sense, the influence of healthy behaviors contributes to the development of the brain during its critical periods of maturation.

These results further increase health concerns during social isolation, since low levels of physical activity and high screen time are associated with increased risks for overweight and obesity (Florêncio Júnior; Paiano; Costa, 2020). Rocha *et al.* (2021) corroborate that behavioral changes since the beginning of the pandemic have caused an increase in screen time among children and adolescents, in addition to other health-related losses, such as physical inactivity, unfavorable eating habits, and irregular sleep. The results of the study pointed out that the reflection of the lack of physical activity in this age group impacted the health of children and adolescents, since physical exercises are associated with the strengthening of the immune system and motor development, in this sense, a sedentary lifestyle during the period of social isolation can contribute to the development of chronic non-communicable diseases, such as diabetes, obesity and hypertension.

For Bueno and Silva (2021), the pandemic proved delays in the children's psychomotor process, as the lack of interactive play proposed by schools impaired motor coordination and adequate laterality, as they could not be developed at this time of pandemic in early childhood education. Thus, the authors consider that the teacher's experience and didactics, as well as technological means, do not replace the experience that the child lives with his peers. The mastery of the body, in terms of psychomotor unity, is inseparable from mental, intellectual, emotional and neurocognitive phenomena.

The monitoring of the motor development of children and adolescents contributes to the increase of motor skills, which have repercussions on future life, whether in social, intellectual and cultural aspects. Thus, the practice of children's physical activity is one of the main stimuli in maintaining cardiovascular health, strengthening bones, joints and muscles, and metabolism, for example.

In this context, it is important to engage children and adolescents in healthy habits. For Florêncio Júnior, Praiano and Costa (2020) first of all, family members are vitally important to encourage children and adolescents to practice physical exercise during social isolation. Secondly, physical education teachers who can be accessed remotely through the environments made possible by ONLINE schools or even through social networks by publishing videos and suggesting activities. And, finally, governments should support projects that encourage the practice of physical activity for this population, based on

scientific literature and considering cultural, social, and economic aspects, while respecting social isolation strategies due to the COVID-19 pandemic.

In the study by Silva *et al.* (2020) indicate that weekend days and weekdays during the pandemic are similar to weekdays, final days, or vacation period before the pandemic. In general, this occurred because the school's routine must adapt to the challenges of distance classes, so the difficulty in accessing the internet and dealing with new technologies were some of the difficulties faced by students and teachers. There was therefore a reduction in the time of physical activity of the children, in the study by Silva *et al.* (2020) showed that before COVID-19 the time spent on physical activity was 30 minutes and during social isolation the time spent decreased to 17 minutes.

The school provides opportunities for the students' body culture through the practice of physical and sports exercises through human motor skills and body expression, which are essential for physical and mental health, in view of its preventive character, since school physical education stimulates socialization, motor development, cooperation, empathy and knowledge of the body. This absence of social interaction among students in the virtual environment was pointed out by Godoi *et al.* (2021) as one of the difficulties of physical education classes, as they believe that the identity of the discipline is characterized by know-how, by the experiences and bodily experimentations of movement, and that it ended up being lost during social isolation due to emergency remote teaching practices, contributing to the increase in sedentary behaviors among students.

These behaviors may be associated with negative results for the child's health, so the school can be an important environment to protect them from exposure to these sedentary behaviors, considering that the institution has characteristics of a structured environment, and that it can establish a consolidated routine of physical activity for children (Silva *et al.*, 2020). Thus, for Santos, Pereira and Borges (2015), sedentary lifestyle and childhood obesity have a very close relationship. The role of this relationship contributes to serious consequences. For this reason, it is necessary to promote physical activities to children. The performance of physical activities in the school context is of paramount importance for the acquisition of healthy lifestyle habits, as well as in the cognitive and motor development for these subjects.

CONCLUSION

The social isolation resulting from the COVID-19 pandemic negatively impacted the physical activity routine of children, thus bringing several physical and mental consequences, such as a sedentary lifestyle and delayed motor development. In this context, it is necessary that the school, government officials and parents support projects that stimulate and respect the motor and cognitive maturation process of children, considering their social, cultural and economic aspects, in order to make them able to perform functional and postural movements, according to their life context.

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