The Impact of the COVID-19 Pandemic on Children's Motor Skills (Literature Review)

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Abstract

This study aims to provide information about the impact of the COVID-19 pandemic on children's motor skills so that they can anticipate the prevention of motor skills decline and efforts to promote children's health behavior during the COVID-19 pandemic. This study uses a literature review method using a comprehensive strategy such as searching for articles in research journal databases. The databases used are Pubmed/MEDLINE, Scopus, Web of Science, and Embase. The keywords used in the search were COVID-19, motor skills, sports, movement and children. There were 20 articles obtained, and 7 articles were analyzed through the purpose, suitability of the topic, sample size, research protocol, and the results of each article. The results of this study explain that the COVID-19 pandemic has resulted in decreased motor skills due to children's activities at home such as increased sleeping habits, increased eating habits, increased screen time. Thus the role of parents is very important to maintain children's motor skills during the COVID-19 pandemic.

Keywords: COVID-19, motor skills, sports, movement, children.

1. Introduction

Motor skills relate to a person's ability to perform a wide range of locomotor, stability, and manipulative activities [1,2]. These skills are concerned with the development and performance of human movement in various basic movement skills such as running, catching, catching, as well as developing more specialized movement sequences, which can lead to physical activity and skills [3,4].

In recent years many children have been forced to stay at home due to the spread of the new coronavirus disease 2019 (COVID-19) [5,6]. To avoid the spread of the COVID-19 virus, schools in various parts of the world are closed from March 2019 until now [7,8]. leaving the house is prohibited, except for work that cannot be seen or for medical reasons that require treatment, all non-essential services and production are stopped and all sporting and recreational activities are also suspended [9]. this will certainly cause limitations in physical activity for a long time in children's lives [10]. Children who are confined to their homes and do not have access to structured movement, playing outdoors with friends reduce their physical activity behavior and change their eating habits [11,12].

Previous research has reported that as long as children do not go to school, lack of physical activity and adopt a healthy lifestyle, things that are often done such as sedentary activities, will have an impact on children's health

and movement skills. [13,14]. Considering the ethical implications, imposing children for extended periods of time testing physical activity restrictions is never an option. COVID-19 gave us a unique opportunity to test this in a literature study, What is the impact of the COVID-19 pandemic on children's motor skills?

This study aims to provide information about the impact of the Covid-19 pandemic on children's motor skills so that they can anticipate the prevention of motor skills decline and efforts to promote children's health behavior during the Covid-19 pandemic.

2. Material and Methods

This study uses a literature review method using a comprehensive strategy such as searching for articles in research journal databases. The databases used are Pubmed/MEDLINE, Scopus, Web of Science, and Embase. The inclusion criteria in this study are international journals published in the last five years in 2021, journals that discuss Covid-19, motor, movement, health, children, and sports. The exclusion criteria in this study were local journals, and journals that were not reputable. The keywords used in the search were COVID-19, motor skills, sports, movement and children. There were 20 articles obtained, and 7 articles were analyzed through the purpose, suitability of the topic, sample size, research protocol, and the results of each article.

3. Results

The results of the research used in this literature review are as follows:

Table 1. Review of Research Results

Author	Sample Characteristics	Study Design	Protokol	Result
(Asano etal 2021) [15]	A 7 year old boy with cerebral palsy	Case Report	COVID-19, motor fungtion	During the COVID-19 pandemic, children's motor function decreased during the time due to discontinuation of physical therapy, the gross motor function measurement score decreased from 34.5-31.9%.
(Moree et al, 2020) [16]	1503 parents of children aged 5-11 years participated in this study.	Cross Sectional	COVID-19, movement behavior	The COVID-19 pandemic has had a negative impact on the movement and play behavior of children in Canada
(phytanza, Burhaein,and pavlovic 2021) [17]	25 children aged 8-12 years	Ex Post Facto	COVID-19, gross and fine motor skills	The results of this study indicate that80% of children's gross motor skills are in the low category, and 20% of children's gross motor skills are in thevery low category
(CarcamoOyarzun, 45 Romero-Rojas, And Estevan 2021) [18]	104 students (55 girls and boys), aged between 9-13 years	Ex Post Facto	COVID-19, Perception of motor competence	Differences were found according to gender, with boys showing a higher perception of motor competence than girls.
(Nyström et al. 2020) [19]	58 boys and 42 girls took part in this study	Cross Sectional	COVID-19, gross and fine motor skills, screen time	The COVID-19 pandemic has made children think about excessive screen time, physical activity outside the home on weekends. So this will have an impact on the motor skills of children.
(Yarımkayaand Esentürk 2020) [20]	12 parents of children with Autism Spectrum Disorders participated in thisStudi	Qualitative Design	COVID-19, physical inactivity, motorskills	The COVID-19 pandemic has resulted in the emergence of sleeping habits, sedentary habits, lazy to move, and eating habits that cause their motor skills to decrease.
(Hosain dkk. 2021) [21]	63 children aged 3-4 years represented by their parents participated in this study	Pilot Study	COVID-19, physical activity, fine and gross motorskills	During the COVID-19 pandemic, there was a significant decrease in children's physical activity, a significant increase in screen time, whitch will cause children's motor skills to deteriorate.

4. Discussion

COVID-19 is an infectious disease that generally attacks the respiratory tract caused by the corona virus (SARS-CoV-2) [22,23]. Coronaviruses being encased positive sense RNA viruses with spike-like projections on their surface that give them a crown-like appearance under the electron microscope, thus the name coronavirus [24,25]. Symptoms that appear when infected with COVID-19 include the onset of acute respiratory distress, fever, cough, sore throat, loss of smell, headache, headache, weakness, myalgia, and dyspnea. In a small percentage of patients, the condition can develop to pneumonia, respiratory failure, and mortality by the end of the first week. Inflammatory cytokines such as IL-2, IL7, IL-10 and TNF-g are all related with this development [26,27]. When a person is infected with Covid-19, shortness of breath symptoms will appear on day 5, on day 8 there will be an acute respiratory distress syndrome that will threaten a person's life, in this condition 25-30% of patients really need intensive care in hospital [28–30] . The recovery period for COVID19 sufferers starts from the 3rd week since the beginning of being infected with Covid-19. A very fatal thing when a person suffers from comorbidities such as hypertension, diabetes mellitus, obesity, lung disease, and heart disease [25,31–33]. At the beginning of 2019 until now governments around the world have enforced restrictions ranging from working at home, studying at home, reducing activities outside the home to prevent the spread of COVID-19 [34,35]. The COVID-19 pandemic has forced many adjustments to daily activities that are necessary to maintain individual health [36,37]. Meanwhile, it is important to remember that children all over the world are growing and developing, running, monitoring and other physical activities will shape their motor skills [38,39]. With the COVID-19 pandemic, the role of parents is very important in preventing the decline in children's motor skills during the COVID-19 pandemic.

In this literature, research conducted by (Moree et al, 2020) [15] reported that 1503 children in Canada who were included in the study, found that the COVID-19 pandemic had an impact on their movement and play behavior. In addition, in a study conducted by (Phytanza, Burhaein, and Pavlovic 2021) [17] reported that during the covid-19 pandemic. 80% of children's gross motor skills are in the low category, and 20% of children's gross motor skills are in the very low category. A similar case was also reported in a study (Nyström et al. 2020) [19] explaining that during covid-19 children are preoccupied with excessive screen time activities, and activities outside the home are only done on weekends, this has a very bad impact on skills. they. In addition, research (Yarımkaya and Esentürk 2020) [20]Reported that during the COVID-19 pandemic research participants with autism disorders experienced an increase in sleeping habits, eating habits, and lazy to move, so that it would have an impact on their health and motor skills. Research (Hosain et al. 2021) [21] COVID-19 has resulted in an increase in screen time and a significant decrease in physical activity in children.

Thus, it can be seen that the COVID-19 pandemic has resulted in a decrease in motor skills due to children's activities at home such as increased sleeping habits, increased eating habits, increased screen time. If this is left unchecked, it will have a bad impact on children, we suggest parents to always do physical activities at home with their children.

5. Conclusions

The COVID-19 pandemic has an impact on children's motor skills, this is due to a lack of physical activity while at home, increased sleeping habits, increased eating habits and increased screen time habits during the COVID-19 pandemic.

It should be noted that the role of parents is very important to maintain children's motor skills during the covid19 pandemic.

References

1. Nobre FSS, Valentini NC, Rusidill ME. Applying the bioecological theory to the study of fundamental motor skills*. Phys Educ Sport Pedagog. 2020. doi:10.1080/17408989.2019.1688772
2. Valadi S, Gabbard C. The effect of affordances in the home environment on children's fine- and gross motor skills. Early Child Dev Care. 2020. doi:10.1080/03004430.2018.1526791
3. Burns RD, Fu Y, Hannon JC, Brusseau TA. School physical activity programming and gross motor skills in children. Am J Health Behav. 2017. doi:10.5993/AJHB.41.5.8
4. Zysset AE, Kakebeeke TH, Messerli-Bürgy N, et al. The validity of parental reports on motor skills performance level in preschool children: a comparison with a standardized motor test. Eur J Pediatr. 2018. doi:10.1007/s00431017-3078-6

5. Ciuca IM. COVID-19 in children: An ample review. Risk Manag Healthc Policy. 2020. doi:10.2147/RMHP.S257180
6. Vargas JRN. The COVID-19 pandemic. Rev Fac Med. 2020. doi:10.15446/revfacmed.v68n1.86482
7. Guren C, McIlroy T, Sieck S. COVID-19 and Book Publishing: Impacts and Insights for 2021. Publ Res Q. 2021. doi:10.1007/s12109-021-09791-z
8. Velavan TP, Meyer CG. The COVID-19 epidemic. Trop Med Int Heal. 2020. doi:10.1111/tmi.13383
9. Gruber R, Saha S, Somerville G, Boursier J, Wise MS. The impact of COVID-19 related school shutdown on sleep in adolescents: a natural experiment. Sleep Med. 2020. doi:10.1016/j.sleep.2020.09.015
10. Maugeri G, Castrogiovanni P, Battaglia G, et al. The impact of physical activity on psychological health during Covid-19 pandemic in Italy. Heliyon. 2020. doi:10.1016/j.heliyon.2020.e04315
11. Woods JA, Hutchinson NT, Powers SK, et al. The COVID-19 pandemic and physical activity. Sport Med Heal Sci. 2020. doi:10.1016/j.smhs.2020.05.006
12. She J, Liu L, Liu W. COVID-19 epidemic: Disease characteristics in children. J Med Virol. 2020. doi:10.1002/jmv.25807
13. Baysun Ş, Akar MN. WEIGHT GAIN IN CHILDREN DURING THE COVID-19 QUARANTINE PERIOD. J Pediatric Child Health. 2020. doi:10.1111/jpc.15105
14. Hidayat NR, Asdi R, Fitria N. Role of parents in improving children's fine motor skills at home during the COVID19 pandemic. In: PervasiveHealth: Pervasive Computing Technologies for Healthcare. ; 2020. doi:10.1145/3452144.3452229
15. Asano D, Kikuchi N, Yamakawa T, Morioka S. Case report decline in motor function during the covid-19 pandemic restrictions and its recovery in a child with cerebral palsy: A case report. Children. 2021. doi:10.3390/children8060511
16. Delecroix B, Abaïdia AE, Leduc C, Dawson B, Dupont G. Curcumin and piperine supplementation and recovery following exercise induced muscle damage: A randomized controlled trial. J Sport Sci Med. 2017.
17. Rodrigues HCN, Martins TFP, Santana NCF e. S, et al. Antioxidant and anti-inflammatory response to curcumin supplementation in hemodialysis patients: A randomized, double-blind, placebo-controlled clinical trial. Clin NutrESPEN. 2021;44:136-142. doi:10.1016/j.clnesp.2021.06.006
18. Carcamo-Oyarzun J, Romero-Rojas F, Estevan I. Impact of the COVID19 pandemic on the perception of motor competence in schoolchildren from Temuco, Chile. Retos. 2021. doi:10.47197/RETOS.V43I0.87496
19. Nyström CD, Alexandrou C, Henström M, et al. International study of movement behaviors in the early years (Sunrise): Results from sunrise sweden's pilot and covid-19 study. Int J Environ Res Public Health. 2020. doi:10.3390/ijerph17228491
20. 20. Yarımkaya E, Esentürk OK. The novel Coronavirus (COVID-19) outbreak鳥: Physical inactivity and children with Autism Spectrum Disorders. Life Span Disabil XXIII. 2020.
21. Hossain MS, Deeba IM, Hasan M, et al. International study of 24-h movement behaviors of early years (SUNRISE): a pilot study from Bangladesh. Pilot Feasibility Stud. 2021. doi:10.1186/s40814-021-00912-1
22. Fogarty H, Townsend L, Ni Cheallaigh C, et al. COVID19 coagulopathy in Caucasian patients. Br J Haematol. 2020. doi:10.1111/bjh.16749
23. El-Hani CN, Machado V. COVID19: The need of an integrated and critical view. Ethnobiol Conserv. 2020. doi:10.15451/EC2020-05-9.18-1-20
24. Singhal T. A Review of Coronavirus Disease-2019 (COVID-19). Indian J Pediatr. 2020. doi:10.1007/s12098-02003263-6
25. Moghadam SO, Afshar D. A review on coronavirus disease 2019 (COVID-19) in pediatric patients. Arch Pediatr Infect Dis. 2020. doi:10.5812/pedinfect.104225
26. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020. doi:10.1016/S0140-6736(20)30211-7
27. Ayubi N, Regita D, Putri S. Aerobic Exercise and Omega 3 Supplementation to Reduce Primary Dysmenorrhea (Literature Review). 2021;15(3):1413-1417.
28. Dorizzi C, Scotton F, Merlin F, et al. Rebirth in a COVID hospital: A point of view. Minerva Obstet Gynecol. 2021. doi:10.23736/S2724-606X.20.04701-2
29. Grippaudo FR, Migliano E, Redi U, et al. The impact of COVID-19 in plastic surgery departments: a comparative retrospective study in a COVID-19 and in a non-COVID-19 hospital. Eur J Plast Surg. 2020. doi:10.1007/s00238020-01725-w
30. Lwin N, Burgess J, Johnston C, Johnson N, Chung S. Hospital-in-the-Home experience of first 23 COVID-19 patients at a regional NSW hospital. Intern Med J. 2020. doi:10.1111/imj.15016
31. Sucher AJ, Sayre TJ, Dagen K, Vasas T, Chahine EB. A review of coronavirus disease 2019 (COVID-19) for pharmacists. US Pharm. 2020.

32. Vasas T, Chahine EB, Sucher AJ, Sayre TJ, Dagen K. A review of coronavirus disease 2019 (COVID-19) for pharmacists. US Pharm. 2020.

33. Jebril N. World Health Organization Declared a Pandemic Public Health Menace: A Systematic Review of the Coronavirus Disease 2019 "COVID-19." SSRN Electron J. 2020. doi:10.2139/ssrn.3566298

34. Barnett ML, Grabowski DC. Nursing Homes Are Ground Zero for COVID-19 Pandemic. JAMAHeal Forum. 2020. doi:10.1001/jamahealthforum.2020.0369

35. Hsu LC, Henke A. COVID-19, staying at home, and domestic violence. Rev Econ Househ. 2021. doi:10.1007/s11150-020-09526-7

36. Phytanza DTP, Burhaein E, Pavlovic R. Gross motor skills levels in children with autism spectrum disorder during the covid-19 pandemic. Int J Hum Mov Sport Sci. 2021. doi:10.13189/saj.2021.090418

37. Li S, Cui G, Kaminga AC, Cheng S, Xu H. Associations between health literacy, ehealth literacy, and covid- 19related health behaviors among chinese college students: Cross-sectional online study. J Med Internet Res. 2021. doi:10.2196/25600

38. Komaini A. Fundamental motor skills of kindergarten students (a survey study of the influence of financial condition, playing activity, and nutritional status). In: IOP Conference Series: Materials Science and Engineering.;2017. doi:10.1088/1757-899X/180/1/012156

39. Komaini A, Hidayat H, Ganefri, et al. Motor Learning Measuring Tools: A Design And Implementation Using Sensor Technology For Preschool Education. Int J Interact Mob Technol. 2021. doi:10.3991/ijim.v15i17.25321