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Association of parent-child physical activity: a review update of Brazilian studies – Report Card Brazil

Associação da atividade física entre pais e filhos: atualização de revisão em estudos brasileiros - Report Card Brasil

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Abstract – This systematic review update aimed to search for new evidences about parent-child physical activity among Brazilian studies. A new literature search for Brazilian studies published until 31 December 2019 was performed in the databases Medline, Embase, Cinahl, Lilacs, Sport Discus, and SciELO by the combination of descriptors regarding children and adolescents, physical activity, and parental support, restricted to English and Portuguese language. As result, only one new study were included besides those from previous review which corroborated with previous findings about positive relationship of parent-child physical activity. The included studies (n=14) were presented according to geographical distribution, year of publication, research design and physical activity assessment method. Limitations and future directions about specific physical activity domains and weekly amount, as well as peers and environmental support were highlighted. This review findings reinforced that parental lifestyle behavior is an important factor for active lifestyle promotion among Brazilian children and adolescents.

Key words: Youth; Lifestyle behavior; Father; Mother; Familiar support; Exercise.

Resumo – *Esta atualização de revisão sistemática teve como objetivo buscar por novas evidências acerca da prática de atividade física de pais e filhos em estudos brasileiros. Uma nova busca na literatura por estudos brasileiros publicados até 31 de dezembro de 2019 foi realizada em cinco bases de dados (Medline, Embase, Cinahl, Lilacs and SciELO) por meio da combinação de palavras-chave sobre crianças e adolescentes, atividade física e apoio parental, restritos aos idiomas inglês e português. Como resultado, apenas um novo estudo foi incluído além daqueles provenientes da revisão prévia, que corroborou com os achados prévios sobre a relação positiva da atividade física entre pais e filhos. Os estudos que foram incluídos (n=14) são apresentados de acordo com a distribuição geográfica, ano de publicação, desenho da pesquisa e método de avaliação da atividade física. São destacadas limitações e futuros direcionamentos sobre domínios específicos da atividade física e volume semanal, bem como influência dos pares e do ambiente. Os achados desta revisão reforçaram que o estilo de vida dos pais corresponde a um fator importante para promoção de estilo de vida ativo em crianças e adolescentes brasileiros.*

Palavras-chave: *Estilo de vida; Filhos; Pais; Mães; Suporte familiar; Exercício.*

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INTRODUCTION

The insufficient levels of physical activity among children and adolescents is a global public health burden, since 81% of young people worldwide do not meet physical activity recommendations[1]. The widespread of technology with screen devices, social media, and broadband internet access has substantially affected lifestyle habits in pediatric population, by reducing their daily active time[2-4].

The parental support play an important role for lifestyle behavior improvement among pediatric population. Indeed, while parent's motivation was a barrier for physical activity at younger ages, improved parental affective experiences was considered as a potential strategy for physical activity enhancement in youth[5].

Investigating determinants of lifestyle behavior in children and adolescent might provide important information for guiding health promotion policies since early ages, mainly among low- and middle-income countries. A previous review among Brazilian studies was conducted including those published until April 2018[6], suggesting that most of studies found a positive association between physical activity of parents and physical activity of their children. Thus, this systematic review updated the previous review investigating the association of parents' physical activity and their children physical activity among Brazilian studies focused on childhood and adolescence. This review is part of the Report Card Brazil, which is a research project focused on presenting indicators for physical activity of Brazilian children and adolescents[7].

METHOD

We updated the searches of the previous systematic review investigating the relationship between physical activity of parents and physical activity of their children among Brazilian sample studies[6]. The searches were performed in the following electronic databases in March 2020: Medline via OVID, Embase, CINAHL via EBSCO, LILACS, and SPORTDiscus via EBSCO. We combined terms related to physical activity (i.e. physical exercise, walking, running, sport, motor activity), youth (i.e. child, adolescent, preschool) and social support (i.e. encouragement, incentive). The results were restricted to publications in English and Portuguese. Although searches were performed in June 2020, only studies published until December 2019 were included due to the spread of Pandemic of Coronavirus disease 2019 (COVID-19) occurred in 2020. This procedure was adopted because people possibly had their lifestyle substantially affected for social isolation policies. Chart 1 details the search strategy performed in Medline.

Chart 1. Search strategy in Medline database.

1. exercise.mp. or Exercise
2. exercise.mp.
3. exercis*.mp.
4. motor activit*.mp.
5. Exercise/
6. leisure activit*.mp.
7. physical fitness.mp.
8. physical endurance.mp.

Chart 1. Continued...

9. Physical Endurance/
10. exercise tolerance.mp.
11. Exercise Tolerance/
12. aerobic.mp.
13. physical activity.mp.
14. Motor Activity/
15. or/1-14
16. children.mp.
17. child*.mp.
18. parent*.mp.
19. mother*.mp.
20. father*.mp.
21. caregiver*.mp.
22. young person.mp.
23. young people.mp.
24. teenage*.mp.
25. adolescent*.mp.
26. boy*.mp.
27. girl*.mp.
28. or/16-27
29. social support*.mp.
30. family.mp.
31. peer.mp.
32. friend.mp.
33. school.mp.
34. support.mp.
35. encourage*.mp.
36. help.mp.
37. assist*.mp.
38. emotion*.mp.
39. instruction*.mp.
40. information*.mp.
41. psychosocial.mp.
42. or/29-41
43. Brazil/
44. brasil.mp.
45. brazilian.mp.
46. or/43-45
47. 15 and 28 and 42 and 46

Two independent reviewers (GCRS and CCR) screened the titles and abstracts retrieved by the search strategy and, then, evaluated the full-texts of the potentially eligible studies. In case of disagreement, a third reviewer (DGDC) was consulted to resolve through consensus.

Cross-sectional, longitudinal and clinical trial studies were included in this review; however, we excluded systematic reviews. We included studies recruiting

young participants aged less than 18 years old containing information of their respective parents. The measurements of physical activity were considered both subjective (i.e. questionnaires, physical activity diaries) and objective methods (i.e. accelerometer, pedometer).

Two independent reviewers (BTCS and WRT) extracted data from included studies using a standardized form. In case of disagreement, a third reviewer (DGDC) arbitrated the decision. The following information was extracted from included studies: sample characteristics (i.e. sample size, age, sex); study design (i.e. cross-sectional, longitudinal study); physical activity assessment method (objective or subjective methods); and main results (positive, negative, or null association). The results of the included studies were narratively described and displayed in Figures.

RESULTS

In the search process, after removing duplicates, screening by title and abstract, and evaluating the full-texts, only one new article involving the physical activity of parents and children was found with Brazilian sample and was included in the review[8]. The date for selecting the studies comprised the years of 2018 and 2019, aiming to preclude effects from the COVID-19 pandemic. Figure 1 represents the steps for selecting process to the review articles.

A total of 19,494 children and adolescents (10,326 girls) with at least information of one parent (father, mother or both) were included. The new included study[8] was conducted in the Southeast region of Brazil, with observational methodology and with cross-sectional design in a sample of 1231 adolescents between 12 to 17 years old, 1202 mothers, and 871 fathers. Christofaro et al.[8] assessed physical activity using self-report information provided by Baecke's questionnaire and observed that father's PA was related with PA of their children at domains of leisure time (β=0.26, $p<0.01$ for boys and β=0.21, $p<0.01$ for girls), occupational (β=0.45, $p=0.01$ for girls), and in total PA (β=0.23, $p<0.01$ for boys and β=0.20, $p<0.01$ for girls). It was observed that mother's PA was related with PA of their children at domains of leisure time (β=0.22, $p=0.01$ for boys and β=0.35, $p<0.01$ for girls), occupational (β=0.63, $p<0.01$ for boys and β=0.70, $p<0.01$ for girls), and in total PA (β=0.23, $p<0.01$ for boys and β=0.34, $p<0.01$ for girls)[8].

The Figure 2 shows the geographical distribution of all included studies in the previous and updated review[8-21]. The evidence in literature about Brazilian parent-child physical activity was concentrated only in six States (Rio Grande do Sul, Parana, Sao Paulo, Minas Gerais, Pernambuco, and Paraiba), mainly among those located at South region, which concentrates eight from the 14 included studies[8,9,11,13,14,18,20,21].

When observed the number of studies according to year of publication, the half of included studies are concentrated between years 2011 and 2015[12-18], even though no study published in 2012. This information is presented in Figure 3.

Figure 4 shows the distribution of included studies according to research design and physical activity assessment[8-21]. It was observed that only one study reported device-measured physical activity[11] and only two studies had longitudinal design[11,20].

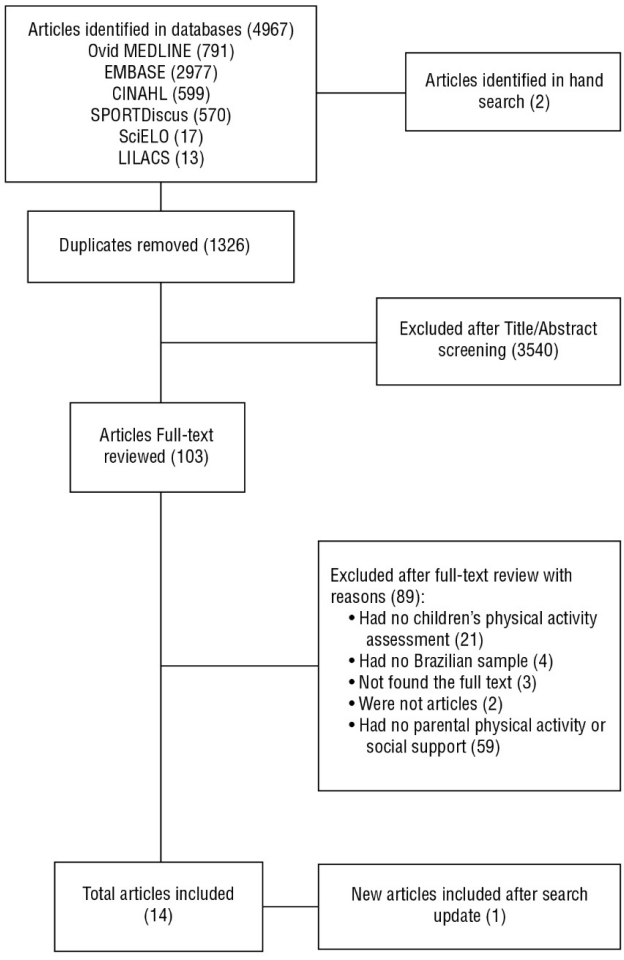

Figure 1. Flowchart of the articles selection process in update search.

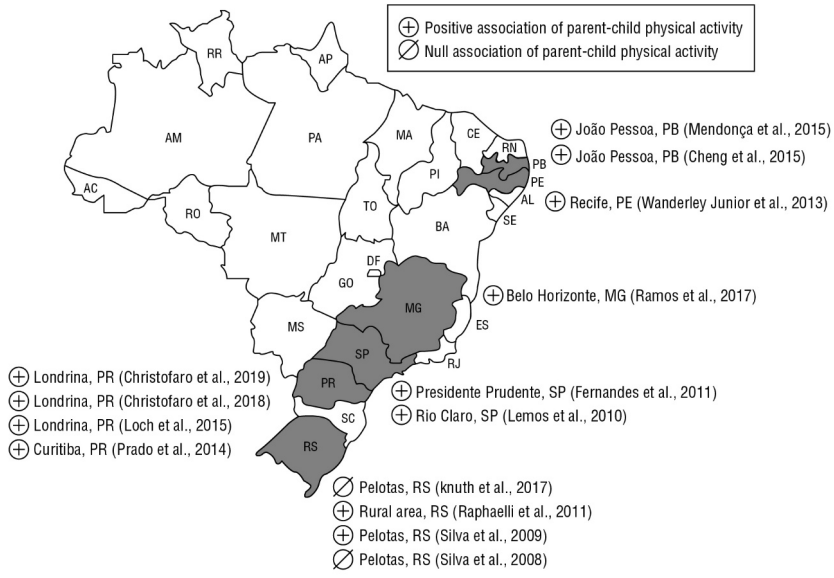

Figure 2. Geographical distribution of included studies (n=14).

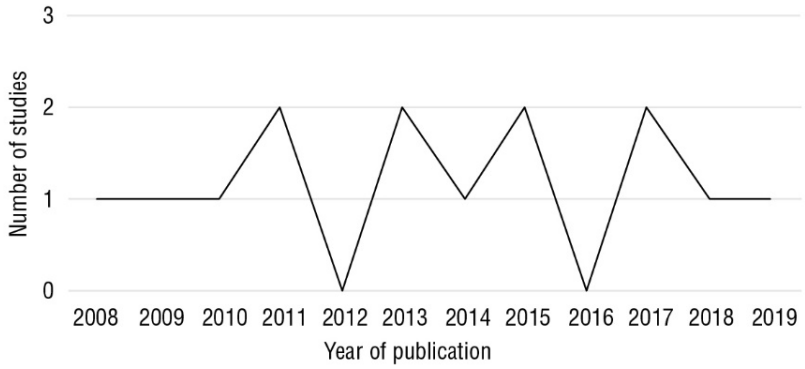

Figure 3. Number of included studies according to year of publication (n=14).

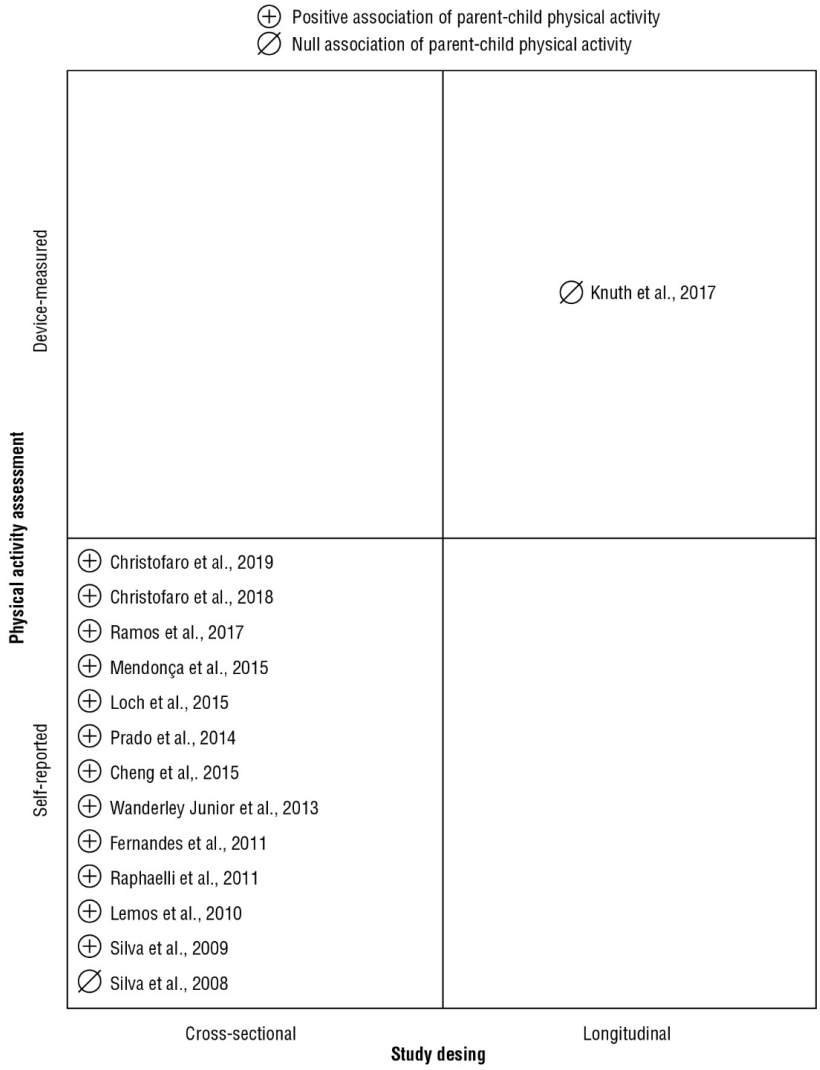

Figure 4. Distribution frame of included studies according to research design and physical activity assessment (n=14).

DISCUSSION

This review shows that physical activity of parents was associated with physical activity of their children in most included studies. Two studies reported lack of association, but there was no evidence on negative association. The updated search identified one new article to be included in this review and, therefore, the current findings allign with previous review.

The inclusion of one new article in the updated search of this review which highlights the need of furhter investigations to investigate the determinants of lifestyle behavior in Brazilian children and adolescents, by considering the influence of familiar and social environment on their lives. Furthermore, the limited number of Brazilian publications over the last years does not allow us to provide more robust inferences.

Another important limitation of the literature is the lack of studies measuring physical activity of parents and their children using objective methods. In fact, only one study used device-measured physical activity and observerd null association of parent-chid physical activity[11]. Although validated instruments have been used for physical activity assessment in the included studies, self-reported information could be prone to recall bias and classification of intensity[22]. Otherwise, device-measured physical activity does not allow us to infer about specific domains where physical activity is performed. Therefore, the use of both methods is suggested for a more complete information on physical activity levels[23].

The influence of specific domains of phyiscal activity in parent-child lifestyle behavior is also not consensual and could not be clarified in this review. The relationship between physical activity engagement and benefits on mental health could be domain-dependent[24]. For this reason, the influence of parental physical activity in specific domains on the lifestyle behavior of their children also needs to be further investigated. This evidence would be important for family strategies of healthy lifestyle implementation.

Another important limitation lies on the lack of information regarding the association of parent-child physical activity over the time, once only one study had longitudinal design[11] and found no association of parent-child physical activity among 4-year-old children. Silva et al.[20] found positive association between parent-child physical activity in a birth-cohort, but using only cross-sectional data. The few studies envolving Brazilian samples with longitudinal information of parent-child physical activity precluded to infer whether higher parental amount of physical activity could be associated with higher chance of their children be physically active.

The findings of this review reinforces the important role of parental lifestyle behavior for consolidation of healthy habits in pediatric population. Indeed, the parental/familiar support is an important factor for physical activity promotion among children and adolescents for both, daily life and during critical periods of public health like the Covid-19 pandemic[25]. Furthermore, other types of social support has been associated with physical activity in youngsters[26] and need to be further examined among Brazilian studies, as the influence of lifestyle behaviors of peers (children and adolescents of conviviality) and those from other family members, like siblings and grandparents, as well as the influence of scholar environment (i.e. lifestyle behavior of teachers and availability of scholar sport programs).

CONCLUSION

In conclusion, physical activity of parents was positively related with physical activity of their children in Brazilian studies. The parental support for lifestyle behavior of pediatric population in low and middle-income countries highlight the positive influence of familiar habits in a continentaly sized country with high socioeconomic and health inequities as Brazil.

COMPLIANCE WITH ETHICAL STANDARDS

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Ethical approval

This study was written in accordance with the standards set by the Declaration of Helsinki.

Conflict of interest statement

There is no conflict of interests to declare about this article.

Author Contributions

Conceived and designed the experiments: DGDC, CBO, WRT. Performed the experiments: CBO, BTCS, TMMD, GCRS and CCR. Analyzed the data: BTCS, GS, and WRT. Contributed reagents/materials/analysis tools: CBO, DGDC, BTCS, TMMD, WRT. Wrote the paper: WRT, BTCS, GCRS, JM, DGDC.

REFERENCES

1. Guthold R, Stevens GA, Riley LM, Bull FC. Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1·6 million participants. Lancet Child Adolesc Health. 2020;4(1):23-35. http://dx.doi.org/10.1016/S2352-4642(19)30323-2. PMid:31761562.
2. Carter B, Rees P, Hale L, Bhattacharjee D, Paradkar MS. Association between portable screen-based media device access or use and sleep outcomes: a systematic review and meta-analysis. JAMA Pediatr. 2016;170(12):1202-8. http://dx.doi.org/10.1001/jamapediatrics.2016.2341. PMid:27802500.
3. Anderson M, Jiang J. Teens, Social Media & Technology 2018 [Internet]. Pew Research Center; 2018 [cited 2019 Apr 22]. Available from: https://www.pewinternet.org/2018/05/31/teens-social-media-technology-2018/
4. Johansson AE, Petrisko MA, Chasens ER. Adolescent sleep and the impact of technology use before sleep on daytime function. J Pediatr Nurs. 2016;31(5):498-504. http://dx.doi.org/10.1016/j.pedn.2016.04.004. PMid:27184356.

5. Bassett-Gunter R, Rhodes R, Sweet S, Tristani L, Soltani Y. Parent support for children's physical activity: a qualitative investigation of barriers and strategies. Res Q Exerc Sport. 2017;88(3):282-92. http://dx.doi.org/10.1080/02701367.2017.1332735. PMid:28622106.

6. Tebar WR, Oliveira CB, Gil FCS, Saraiva BTC, Suetake VYB, Scarabottolo CC, et al. Physical activity of parents and of their children: a systematic review of Brazilian sample studies – Report Card Brazil. Rev Bras Cineantropom Desempenho Hum. 2018;20(4):532-42. http://dx.doi.org/10.5007/1980-0037.2018v20n4p532.

7. Silva DAS, Christofaro DGD, Ferrari GLM, Silva KS, Nardo N Jr, Silva RJS, Fernandes RA, Barbosa VC Fo. Boletim Brasil 2018. Está na hora de cuidar das crianças e dos adolescentes! Relatório sobre atividade física em crianças e adolescentes brasileiros [Internet]. Active HealthyKids Global Alliance; 2018 [cited 2021 Mar 12]. Available from: https://nucidh.paginas.ufsc.br/files/2018/11/REPORT-CARD-Brasil-2018-FINAL-PT.pdf

8. Christofaro DGD, Turi-Lynch BC, Lynch KR, Tebar WR, Fernandes RA, Tebar FG, et al. Parents' lifestyle, sedentary behavior, and physical activity in their children: a cross-sectional study in Brazil. J Phys Act Health. 2019;16(8):631-6. http://dx.doi.org/10.1123/jpah.2018-0173. PMid:31310992.

9. Christofaro DGD, Andersen LB, Andrade SM, Barros MVG, Saraiva BTC, Fernandes RA, et al. Adolescents' physical activity is associated with previous and current physical activity practice by their parents. J Pediatr (Rio J). 2018;94(1):48-55.

10. Ramos CGC, Andrade RG, Andrade ACS, Fernandes AP, Costa DAS, Xavier CC, et al. Contexto familiar e atividade física de adolescentes: cotejando diferenças. Rev Bras Epidemiol. 2017;20(3):537-48. http://dx.doi.org/10.1590/1980-5497201700030015. PMid:29160444.

11. Knuth AG, Silva ICM, van Hees VT, Cordeira K, Matijasevich A, Barros AJD, et al. Objectively-measured physical activity in children is influenced by social indicators rather than biological lifecourse factors: evidence from a Brazilian cohort. Prev Med. 2017;97(1):40-4. http://dx.doi.org/10.1016/j.ypmed.2016.12.051. PMid:28043827.

12. Mendonça G, Farias JC Jr. Physical activity and social support in adolescents: analysis of different types and sources of social support. J Sports Sci. 2015;33(18):1942-51. http://dx.doi.org/10.1080/02640414.2015.1020842. PMid:25751023.

13. Loch MR, Porpeta RH, Brunetto BC. Relação entre a prática de atividade física no lazer dos pais e a dos filhos. Rev Bras Ciênc Esporte. 2015;37(1):29-34. http://dx.doi.org/10.1016/j.rbce.2013.09.001.

14. Prado CV, Lima AV, Fermino RC, Añez CR, Reis RS. Apoio social e prática de atividade física em adolescentes da rede pública de ensino: qual a importância da família e dos amigos? Cad Saude Publica. 2014;30(4):827-38. http://dx.doi.org/10.1590/0102-311X00014313. PMid:24896057.

15. Cheng LA, Mendonça G, Farias Júnior JC. Physical activity in adolescents: analy-sis of social influence of parents and friends. J Pediatr (Rio J). 2014;90(1):35-41. http://dx.doi.org/10.1016/j.jped.2013.05.006. PMid:24156835.

16. Wanderley RS Jr, Hardman CM, Oliveira ESA, Brito ALS, Barros SSH, Barros MVG. Parental factors associated with physical activity among preschoolers: the importance of parents' participation in physical activities with their children. Rev Bras Ativ Fis Saude. 2013;18(2):205-14.

17. Fernandes RA, Christofaro DGD, Milanez VF, Casonatto J, Cardoso JR, Ronque ERV, et al. Atividade física: prevalência, fatores relacionados e associação entre pais e filhos. Rev Paul Pediatr. 2011;29(1):54-9. http://dx.doi.org/10.1590/S0103-05822011000100009.

18. Raphaelli CO, Azevedo MR, Hallal PC. Associação entre comportamentos de risco à saúde de pais e adolescentes em escolares de zona rural de um município do Sul do Brasil. Cad Saude Publica. 2011;27(12):2429-40. http://dx.doi.org/10.1590/S0102-311X2011001200014. PMid:22218585.

19. Lemos N, Nakamura PM, Grisi RNF, Kokubun E. Association between the par-ent's leisure physical activity level and their children's physical activity level. Rev Bras Ativ Fis Saude. 2010;15(2):95-100.

20. Silva SM, Knuth AG, Duca GFD, Camargo MBJ, Cruz SH, Castagno V, et al. Prevalência e fatores associados à prática de esportes individuais e coletivos em adolescentes pertencentes a uma coorte de nascimentos. Rev Bras Educ Fís Esporte. 2009;23(3):263-74. http://dx.doi.org/10.1590/S1807-55092009000300007.

21. Silva ICM, Kremer MM, Hallal PC, Knuth AG, Amorim TEC, Rombaldi AJ, et al. Atividade física de pais e filhos: um estudo de base populacional. Rev Bras Educ Fís Esporte. 2008;22(4):257-63.

22. Folley S, Zhou A, Hyppönen E. Information bias in measures of self-reported physical activity. Int J Obes (Lond). 2018;42(12):2062-3. http://dx.doi.org/10.1038/s41366-018-0223-x. PMid:30301965.

23. Skender S, Ose J, Chang-Claude J, Paskow M, Brühmann B, Siegel EM, et al. Accelerometry and physical activity questionnaires - a systematic review. BMC Public Health. 2016;16(1):515. http://dx.doi.org/10.1186/s12889-016-3172-0. PMid:27306667.

24. White RL, Babic MJ, Parker PD, Lubans DR, Astell-Burt T, Lonsdale C. Domain-specific physical activity and mental health: a meta-analysis. Am J Prev Med. 2017;52(5):653-66. http://dx.doi.org/10.1016/j.amepre.2016.12.008. PMid:28153647.

25. Gilic B, Ostojic L, Corluka M, Volaric T, Sekulic D. Contextualizing parental/familial influence on physical activity in adolescents before and during COVID-19 pandemic: a prospective analysis. Children (Basel). 2020;7(9):125. http://dx.doi.org/10.3390/children7090125. PMid:32899277.

26. Lisboa T, Silva WR, Alexandre JM, Beltrame TS. Suporte social da família e amigos para a prática de atividade física de adolescentes: uma revisão sistemática. Cad Saude Colet. 2018;26(4):351-9. http://dx.doi.org/10.1590/1414-462x201800040463.