

Quality of Life – Research and Innovation

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Relaciones entre actividad física y calidad de vida relacionada con la salud en niños y adolescentes durante la distancia social COVID-19

Relationship between physical activity and health-related quality of life in children and adolescents during COVID-19 social distancing

Relações entre a atividade física e a qualidade de vida relacionada à saúde em crianças e adolescentes durante o distanciamento social COVID-19

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RESUMEN

Este estudio tuvo como objetivo verificar la relación entre la actividad física (AF) y los dominios de la calidad de vida relacionada con la salud (QVRS) en niños y jóvenes durante la distancia social COVID-19. Se aplicó un estudio transversal y analítico con enfoque cuantitativo en una muestra de 119 niñas y 121 niños. Se aplicaron cuestionarios y métodos estadísticos. La correlación entre AF y HQOL fue más fuerte en los niños (46,9%) que en las niñas (14,5%), lo que puede explicarse porque existe una relación considerable y más fuerte entre la edad y el grado escolar con HQOL en las niñas. En conclusión, la actividad física se asoció con la QVRS de los niños y adolescentes durante la distancia social COVID-19. Estos hallazgos muestran la importancia de que esta población se mantenga físicamente activa para que los parámetros de salud no se vean afectados durante este período.

Palabras-clave: Bienestar infantil, Autonomía relacional, Apoyo social, Servicios de salud escolar, Educación y formación física.

ABSTRACT

This study aimed to verify the relationship between physical activity (PA) with health-related quality (HQOL) of life domains in children and adolescents during COVID-19 social distancing. A Cross-sectional and analytical study with a quantitative approach in a sample of 119 girls and 121 boys. Questionnaires and statistical methods were applied. The correlation between PA and HQOL was stronger in boys (46.9%) than girls (14.5%), which may be explained because there is a considerable and stronger relationship between age, and the school grade with

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HQOL in girls. In conclusion, physical activity was associated with the quality of life of children and adolescents during social distance due to the COVID-19. These findings show the importance of this population to remain physically active so that health parameters are not affected during this period.

Keywords: Children welfare, Relational autonomy, Social support, School health services, Physical education and training.

RESUMO

Este estudo teve como objetivo verificar a relação da atividade física (AF) com domínios da qualidade de vida relacionada à saúde (QVRS) em crianças e jovens durante o distanciamento social COVID-19. Foi aplicado um estudo transversal e analítico com abordagem quantitativa em uma amostra de 119 meninas e 121 meninos. Questionários e métodos estatísticos foram aplicados. A correlação entre AF e QVRS foi mais forte nos meninos (46,9%) do que nas meninas (14,5%). Isso foi explicado porque há uma relação considerável e mais forte entre idade e ano escolar com QVRS em meninas. Em conclusão, a atividade física se associou à qualidade de vida de crianças e adolescentes durante o distanciamento social COVID-19. Esses achados mostram a importância dessa população se manter fisicamente ativa para que os parâmetros de saúde não sejam afetados nesse período.

Palavras-chave: Bem-Estar da criança, Autonomia relacional, Apoio social, Serviços de saúde escolar, Educação física e treinamento.

INTRODUCTION

The lifestyle changes on social distancing during pandemic coronavirus (COVID-19) could be related to decreasing health-related quality of life (HQOL), mainly in children and adolescents, that depends on other people and context to do the daily activities, like family, school, and friends (Rundle et al., 2020). Additionally, the probability of people presenting physical inactivity associated with lower levels of HQOL, and mental health problems are higher during this period (Jiménez-Pavón et al., 2020; Lippi et al., 2020; Nguyen et al., 2020). The Chinese population, for example, increased in 55% high-stress symptoms, 59% in anxiety, and 35% increments in depressive responses during social distancing time (Wang et al., 2020).

Besides, this period results in increased physical inactivity, which leads to the development of cardiometabolic risk factors in children and adolescents (Andersen et al., 2015; Di Cesare et al., 2016; Ortega et al., 2018). Also, the out-of-school time increases sedentary behavior, physical inactivity, and obesity (Rundle et al., 2020). A study developed in China, during the pandemic period estimate that people who reach high amounts of physical activity per week have a probability of 2.72 times more likely to present high quality of life compared to those who reach less physical activity levels per week (Nguyen et al., 2020). However, the association between physical activity and HQOL during the COVID-19 pandemic has not been explored in Brazilian children

and adolescents. Studies carried out before this pandemic time suggest these associations, mainly between physical activity and well-being (Brown et al., 2004; Miller et al., 2019; Omorou et al., 2013; Standage et al., 2012).

The present study is of great relevance, once in some Brazilian states, as Santa Catarina, the physical education classes continued during the pandemic COVID-19 through the distance learning intervention. It was one of the first places to make official at public school an online education proposal during COVID-19 isolation time (CEE & Ramos, 2020b, 2020a; Lemes et al., 2022; Ribeiro & Lopes, 2019). This is justified since school is the main environment to social interaction and development of a healthy lifestyle, including physical activity practice, being closely related to the protection of health during COVID-19 time (Rundle et al., 2020).

In general, researches about physical activity and HQOL are well documented in some countries as well the negative impact of COVID-19 in HQOL (Guzmán-Muñoz et al., 2020; Hansel et al., 2022; Kharshing et al., 2020; Lipskaya-Velikovsky, 2021; López-Ruiz et al., 2021; Ovdii et al., 2021; Ozturk & Duruturk, 2021; Riiser et al., 2020). Findings about this indicate that there are positive relations between the Physical activity and HQOL (López-Aymes et al., 2021). However, is still important to confirm these results in low and middle countries like Brazil and Latin America (Lemes et al., 2021a; Lemes et al.,

2021), mainly due to social differences and vulnerability into these countries. From this, the confirmatory scientific reports can lead and reinforce new political procedures to improve the public health services, teaching methods, lifestyle, sports and physical activity for children and adolescents to reach a better level of mental and physical well-being and HQOL (Franco et al., 2021). Thus, understanding the associations between physical activity and HQOL could guide the development of strategies for health promotion in children and adolescents. Taking this aspect into consideration, the present study aimed to verify the relationship between physical activity with HQOL domains in children and adolescents during COVID-19 social distancing.

MATERIAL AND METHODS

Study Design

This is a cross-sectional and analytical study with a quantitative approach. The recruitment was carried out between March 06, and April 30, 2020, during the social distancing of COVID-19, in a public school, located in Imbituba, Santa Catarina – Brazil. For the present study, it was considered an evaluation in physical education classes, which were conducted online through Google suite software, as Classroom, YouTube movies, WhatsApp groups, during this period (Martínez-Rico et al., 2021; Vagos & Carvalhais, 2022). These classes are according Santa Catarina Statement for remote classes (Lemes et al., 2022). The present study was done considering all human recommendations of the Helsinki Declaration and it was approved by the Ethics and Research Committee of Estácio de Sá University Center, number: 3.758.311-CAAE: 25315518.4.0000.5357. The data were obtained at school's work online by means of upper cited software. This method of teaching/research has been developed since March 06 of 2020 due to COVID-19 lockdown and social distancing. Teachers, students, parents, and the school community participating of this study in remote form (Lemes, Fochesatto & Gaya, 2020; Lemes, Gaya, et al., 2020).

Population, sample size, and selection

The sample was selected by convenience, from a population of approximately 750 students regularly enrolled in the school, which was done because the school needed to monitor health indicators in children during social distancing. The sample size calculation

was made in posteriori form on the G* Power 3.1 program (Faul et al., 2007). Poisson models and generalized linear models were considered, with a test power $(1-\beta) = 0.85$, relation strength of 0.20, and error of 5%. The number of predictors was five and the minimum sample size was established as 240 students.

Inclusion and exclusion criteria

This study includes all students who agreed to participate and their parents (responsible) that signed the consent free terms. The availability of smartphones was a requirement to participate in the study, and for the students who did not have internet access, computers, and/or cellphone the classes were available with impress material at delimited days at school. Then, the parent/guardian could collect the material of all school disciplines once a week. Considering this, the students selected ranged between first to the sixth year of elementary education, children and adolescents aged between 6 to 14 years old from 12 classes of physical education, two classes per school grade were included in the study. The participation also depended on family adherence, once parents of children from 6 to 8 years should help them in the process of physical education classes, to answer questionnaires, and in the general application of this research.

Variables evaluation

Physical activity was evaluated by days per week of moderate or vigorous physical activity practice according to the self-perception of students with 10 years old or more, and according to answers of a family member or children's parent for the ones with 9 years or less. The question about physical activity days was adapted from the two first questions of the IPAQ questionnaire to simplify the instrument for a better comprehension (Lemes, Fochesatto & Gaya, 2020; Matsudo et al., 2012), as follow: "During the last 7 days, on how many days did you (or your son in case of parents) practice moderate to vigorous physical activities (MVPA)?" The possible answers ranged from one to seven days. Children that reached seven days were classified as high active according to international guidelines (Sampasa-Kanyinga et al., 2017).

The HQOL measurement was obtained according to Kidscreen-27 for children and adolescents. The instrument has a possibility of answers on an ordinal scale from 0, 1, 2, 3, or 4 levels. Levels 3 and 4 have

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the words responses that explain with great agreement each question: very often, very much, many times, totally or always. The aggregation of some specific questions in scores, created five domains: physical well-being (5 items); psychological well-being (7 items); autonomy and parents (7 items); social support and peers (4 items) and school environment (4 items) (Guedes et al., 2011).

Statistical analysis

For a first description, the Kidscreen variables were transformed into dummy variables, which was performed attributing the dichotomic value of one (1) to two last high values (3-4) of responses of each question and (0) to other values (0-1-2). Considering possible differences and influences of age and sexes in quality-of-life domains, we transformed the continuous domains of quality of life (the total HQOL) in z-scores adjusted for age, sexes, and school grade.

An exploratory analysis was performed through scattering dot graphs, histograms, box plot, and normality curves for continuous variables (transformed data and scores). The first exploratory evaluations showed linear distributions and normal tests possibility for transformed continuous variables, considering respective adjustments (sex, age, and school grade). The Cronbach alpha was also presented for domains of HQOL considering an inclusion of Physical Activity question into analyses. Goodness-of-fit parameters were calculated considering standardized root means square residual (SRMR) <0.10 ; chi-square/degrees of freedom (CMIN/DF) <5 ; both the comparative fit index/incremental fit indices (CFI/IFI) and the Tucker Lewis index (TLI) approximated to 0.90, and finally the root mean square error of approximation (RMSEA) <0.08 (Caldas & Reilly, 2019; Lemes et al., 2021a; Lemes et al., 2021)

Thus, descriptive and comparative evaluation of the quality of life, physical activity, and age means was performed by sex. For comparisons of continuous primarily evaluations, we applied independent Student "t" test and the Cohens D effect was considered to evaluate the effects between sex. Then, we used the Poisson regression model to estimate the prevalence ratio between high values of quality of life from girls related to boys. The prevalence ratio was performed for individuals that reached the recommendation of seven days of physical activity. All Poisson models were adjusted for age, and school grade.

Finally, the association between physical activity and quality of life was measured considering crude variable values in generalized linear models (GLM), and adjusted z-scores of days of MVPA and HQOL total and domains for sexes, age and school grade. We calculated linear explanation (R^2) of moderate to vigorous days per week of physical activity (Z-MVPA) correlated with health-related quality of life (Z-HQOL) with scatter dots of linear regression adjusted for age and school grade. Then, the relationships between MVPA days and HQOL domains in sexes considering adjustment for beta weights of age and school grade were estimated in generalized linear models (GLM). Beta represents the strength of relationships, lower values of Aic and Bic are indicators for the best GLM models. GLM models were selected due to being a robust method, considering versatility, power, and elevated types of scales for statistical calculations. For all analyses, we adopted an alpha of less than 5%. The software SPSS 24.0 was used for all analyses.

RESULTS

Table 1 presents the sample characteristics for girls and boys. Boys showed significant higher levels of MVPA per week, and physical well-being compared to girls. About 9.2% of girls and 22% of boys reached seven days for MVPA. Otherwise, girls have a higher quality of life in the school environment domain compared to boys. The categorical Kidscreen variables showed that boys have been practicing physical activities in a superior proportion (20%) than girls. Boys present 33% more chance to have been practicing physical activities compared to girls, while girls get along well with teachers in 1.11 times more probability than boys.

The internal consistency indexes (Cronbach's alpha) for each HQOL scale domain and Physical activity are 0.740 for physical well-being, 0.598 for psychological well-being, 0.734 for autonomy and parents, 0.655 for social support and peers, and 0.641 for school environment. The goodness-of-fit for the structural equation model for validation of present instruments as acceptable for relationship tests are (SRMR=0.043); (CMIN/DF=2.520); (CFI/IFI=0.951/0.952); (TLI=0.919); (RMSEA=0.080), demonstrating adequate values of consistency, reliability and theoretical validation.

Table 1. Descriptive characteristics of the sample by sex.

Continuous variables	Girls (n=119)		Boys (n=121)		Sex Comparison		
	Mean	SE	Mean	SE	D	t	p
Age (years)	9.01	0.17	8.7	0.17	0.16	1.25	0.214
MVPA (days by week)	2.13	0.19	2.82	0.22	0.31	2.38	0.018
Physical Well Being (score)	13.5	0.3	14.6	0.32	0.33	2.54	0.012
Psychological Well being (score)	10.39	0.42	10.36	0.37	0.001	0.06	0.956
Autonomy and Parents (score)	21.51	0.42	21.39	0.32	0.010	0.24	0.813
Social Support and Peers (score)	9.18	0.36	10.11	0.35	0.26	1.84	0.067
School Environment (score)	13.32	0.21	12.35	0.22	0.44	3.19	0.002
HQOL (total) - Cronbach alpha = 0.799/0.803	68.96	1.17	69.98	1.1	0.081	0.64	0.526
Categorical variables	n Cat (3-4)	%	n Cat (3-4)	%	PR	X2	p
Seven Days of MVPA	11	9.2	22	18.2	0.5	2.74	0.098
Physical Well-Being							
1-In general, how is your health?	85	71.4	76	62.8	1.13	0.57	0.283
2-Have you been feeling good and willing?	89	74.8	91	75.2	1	0.10	0.981
3-Have you been practicing physical activities?	48	40.3	73	60.3	0.67	5.06	0.025
4-Have you been able to run well?	30	25.2	49	40.5	0.62	2.75	0.097
5-Have you been feeling energetic?	87	73.1	104	86	0.86	3.56	0.059
Psychological well-being							
6-Has your life been pleasant?	100	84	104	86	0.99	0.03	0.866
7-Have you been in a good mood?	88	73.9	95	78.5	0.95	0.29	0.59
8-Have you been having fun?	92	77.3	103	85.1	0.91	1.31	0.251
9-Have you been feeling sad?	5	4.2	5	4.1	0.96	0.01	0.952
10-Have you been feeling so bad that you didn't feel like doing anything?	4	3.4	5	4.1	0.78	0.17	0.684
11-Have you been feeling alone?	8	6.7	10	8.3	0.75	0.42	0.515
12-Do you feel happy the way you are?	106	89	107	88.4	1.02	0.10	0.754
Autonomy and Parents							
13-Have you had enough time for yourself?	102	85.7	113	93.4	0.92	2.51	0.113
14-Have you been doing the things you want in your spare time?	89	74.8	96	79.3	0.95	0.48	0.487
15-Do your parents have enough time for you?	92	77.3	97	80.2	0.96	0.24	0.625
16-Do your parents treat you fairly?	101	84.9	102	84.3	1.00	0.01	0.993
17-Are your parents available to speak when you want to?	101	84.9	101	83.5	1.01	0.08	0.779
18- Do you have enough money to do the same things as your friends?	31	26.1	26	21.5	1.22	0.47	0.494
19- Do you have enough money for your expenses?	63	52.9	70	57.9	0.92	0.33	0.566
Social Support and Peers							
20-Have you been spending time with your friends?	18	15.1	31	25.6	0.56	2.36	0.125
21- Do you have fun with your friends?	62	52.1	69	57	0.9	0.42	0.515
22- Do you and your friends help each other?	67	56.3	70	57.9	0.99	0.01	0.931
23-Do you trust your friends?	66	55.5	65	53.7	1.06	0.14	0.709
School Environment							
24-Do you feel happy at school?	97	81.5	86	71.1	1.16	2.76	0.097
25-Are you doing well at school?	82	68.9	76	62.8	1.11	0.83	0.363
26-Have you been able to pay attention at school?	95	79.8	86	71.1	1.13	1.76	0.184
27-Do you get along well with your teachers?	118	99.2	109	90.1	1.11	6.73	0.009

n (Cat 3-4): Dummy variable - number of answers for very (3), much (3), many times (3), totally (4), or always (4) according to Kidscreen-27 scale and interpretation of questions. HQOL. Health-related quality of life; MVPA. Moderate and vigorous physical activity. SE. Standard error; PR. Prevalence Ratio; X2. Chi-square wald.

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Table 2 showed data concerning crude and standardized scores (adjusted by age, sexes, and school grade), for MVPA days per week associated with HQOL domains and HQOL total. These associations suggested that better models are those with adjustment for age, sexes, and school grade. In this sense, results indicated that MVPA days are positively and strongly associated with all domains of HQOL. Physical well-being presented the strongest association, followed by psychological well-being, school environment, autonomy and parents, HQOL total, social support, and peers. This finding indicates the relevance of MVPA practice during COVID-19 social distancing for a better general health perception in children and adolescents.

Figures 1 and 2 showed data distribution in scatter dot graph and linear correlation of MVPA and HQOL total z-scores, adjusted by age and school grade. It was found that these variables are positively associated, with stronger explanation in boys (46.9%) than girls (14.5%).

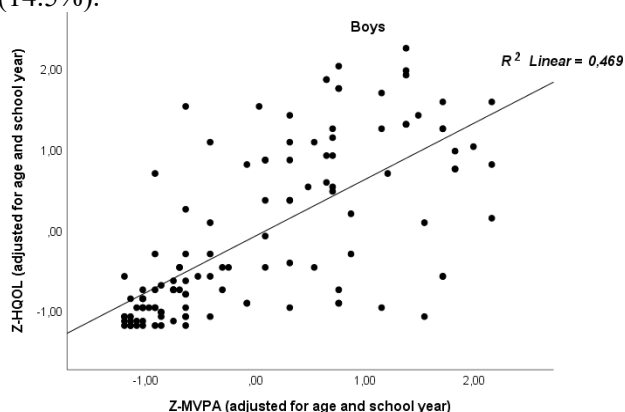


Figure 1. Boys Linear explanation (R^2) of moderate to vigorous days a week of physical activity (Z-MVPA) correlated with health-related quality of life (Z-HQOL). The variables were transformed into z-scores values adjusted for age and school grade.

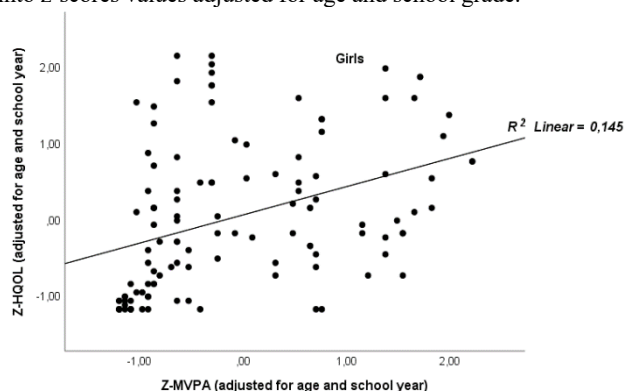


Figure 2. Girls Linear explanation (R^2) of moderate to vigorous days a week of physical activity (Z-MVPA) correlated with health-

related quality of life (Z-HQOL). The variables were transformed into z-scores values adjusted for age and school grade.

Considering the aforementioned results, we applied a moderation analysis (Table 3) between sex, age, and school grade weights in models of MVPA association with each HQOL domain. These results showed the reasons why the strength of the association was different according to sex. Thus, associations were similar in boys and girls only to the positive association of MVPA and physical well-being, MVPA and autonomy, and parents' HQOL domains.

MVPA days and psychological well-being were not associated with girls, because age was negatively correlated with psychological well-being, and school grade was positively related with more strength on this variable. Otherwise, for boys this association was significant, age and school grade were not associated with psychological well-being. A similar effect of relation was found for social support and peer's domain. Therefore, only age was negatively associated with this HQOL domain in girls. In boys, MVPA was strongly and positively associated with social support and peers. MVPA was associated with the school environment domain only in boys, and age was correlated with less HQOL in this domain. In girls, no significant associations were found.

Finally, the relationship between MVPA and HQOL on girls was weaker compared to boys, since there was a considerable and stronger relationship between age and the school grade with HQOL. In girls, one year of age is associated with 5 negative points of HQOL, while one school grade is positively correlated with 4 points of HQOL. In another way, in boys only MVPA was associated with total HQOL, one day of MVPA represented an association with 2.36 points of HQOL, double the power relationship than girls (1.16), without the significant impact of age and school grade.

Table 2. General Relationship between moderate and vigorous physical activity and health-related quality of life, crude values and z-scores (n=240)

Independent Factor (continuous)	Dependent (continuous)	HQOL (CRUDE VALUES)				p	Aic	Bic
		B	SE	Lower	Upper			
MVPA days (days per week)	Physical well-being	0.568	0.091	0.389	0.747	0.001	1239.00	1250.00
	Psychological well-being	0.410	0.122	0.170	0.650	0.001	1380.00	1390.00
	Autonomy and Parents	0.440	0.113	0.219	0.662	0.000	1342.00	1356.00
	Social Support and Peers	0.346	0.111	0.128	0.565	0.002	1334.00	1345.00
	School Environment	0.124	0.069	-0.011	0.259	0.072	1104.00	1115.00
	HQOL Total	1.849	0.335	1.192	2.507	0.001	1856.00	1866.00
Independent Factor (continuous)	Dependent (continuous)	HQOL (ADJUSTED Z-SCORES)				p	Aic	Bic
		B	SE	Lower	Upper			
MVPA days (z- score)	Physical well-being	0.556	0.054	0.451	0.661	0.001	597.00	607.00
	Psychological well-being	0.454	0.058	0.341	0.567	0.001	630.00	630.00
	Autonomy and Parents	0.424	0.058	0.310	0.539	0.001	638.00	648.00
	Social Support and Peers	0.413	0.059	0.298	0.528	0.001	641.00	651.00
	School Environment	0.438	0.058	0.324	0.552	0.001	635.00	645.00
	HQOL Total	0.413	0.059	0.298	0.528	0.001	624.00	635.00

MVPA. Moderated and vigorous physical activity; HQOL. Health-related quality of life; lower and upper are confidence intervals for probability of 95%; B. Beta linear strength relation; SE. standard error; Aic/Bic. Quality of models; p. significant alpha values less than 0.05. Adjusted Z-scores by sex, age, and school grade.

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Table 3. Relationships between moderate and vigorous physical activity days and health-related quality of life domains for boys and girls with adjusted beta weights of age and school grade in generalized linear models

Independent	Girls (119)					Boys (121)					Aic/Bic	
	B	SE	Lower	Upper	p	b	SE	Lower	Upper	p		
(Dependent) Physical Well Being												
MVPA Days	0,48	0,13	0,23	0,74	0,001		0,57	0,13	0,33	0,82	0,001	
Age	-0,54	0,38	-1,28	0,20	0,151	604/618	-0,28	0,40	-1,07	0,52	0,495	634/648
School grade	0,15	0,42	-0,67	0,98	0,717		0,54	0,46	-0,36	1,43	0,240	
Psychological Well Being												
MVPA Days	0,21	0,19	-0,16	0,57	0,262		0,57	0,15	0,27	0,87	0,001	
Age	-2,30	0,53	-3,34	-1,26	0,001	685/699	-0,48	0,49	-1,43	0,48	0,326	680/694
School grade	1,84	0,59	0,68	3,00	0,002		0,44	0,55	-0,64	1,53	0,420	
Autonomy and Parents												
MVPA Days	0,49	0,19	0,11	0,87	0,012		0,42	0,13	0,16	0,67	0,002	
Age	-1,03	0,56	-2,12	0,06	0,065	697/711	-0,09	0,42	-0,91	0,74	0,835	645/659
School grade	1,04	0,62	-0,18	2,26	0,095		0,20	0,48	-0,73	1,14	0,673	
Social Support and Peers												
MVPA Days	-0,21	0,17	-0,55	0,12	0,209		0,68	0,14	0,42	0,95	0,001	
Age	-1,19	0,49	-2,15	-0,24	0,014	665/679	0,48	0,44	-0,38	1,35	0,271	655/669
School grade	1,09	0,54	0,02	2,15	0,046		-0,60	0,50	-1,57	0,38	0,231	
School Environment												
MVPA Days	0,18	0,10	-0,02	0,38	0,080		0,20	0,09	0,03	0,37	0,025	
Age	-0,48	0,29	-1,05	0,09	0,099	542/556	-0,75	0,28	-1,30	-0,19	0,008	549/563
School grade	0,46	0,32	-0,18	1,09	0,161		0,52	0,32	-0,11	1,15	0,102	
HQOL total												
MVPA Days	1,16	0,52	0,14	2,19	0,026		2,36	0,42	1,54	3,18	0,001	
Age	-5,08	1,50	-8,01	-2,14	0,001	924/938	-1,12	1,35	-3,75	1,52	0,406	926/940
School grade	4,17	1,67	0,89	7,45	0,013		1,13	1,52	-1,85	4,12	0,458	

HQOL. Health-related quality of life; MVPA. Moderate and vigorous physical activity. B. beta values; SE. standard error; Lower-Upper: confidence intervals with probability of 95%; p. Significant association <0.05; Aic/Bic. Quality of models.

DISCUSSION

The present study aimed to verify the relationship between physical activity with HQOL domains in children and adolescents during COVID-19 social distancing. The main findings indicate a small proportion of boys (22%) and girls (9.2%) that achieved MVPA seven days a week. Besides, it was found a strong relationship between more days per week of MVPA with all HQOL domains, except for the school environment. However, when the models were adjusted for age, sex, and school grade, all HQOL domains were associated with MVPA presenting the best parameters. When the analyzes were moderated by sex, it was found that the associations of MVPA with the HQOL domains were only observed in boys, except for autonomy, parents, and total HQOL, which remained in both sexes.

Due to social distancing, several daily activities had to be adapted, which also implied changes in lifestyle. Our results showed a small proportion of the sample that has been involved in MVPA seven days a week during the pandemic. This was also found in a study developed in the same period, developed with obese Italian children and adolescents (Pietrobelli et al., 2020). Likewise, a survey that looked at 15 countries showed that the time spent in places associated with physical activities, such as parks, beaches, and community gardens decreased 31% (Guan et al., 2020). Also, a study developed at the beginning of the pandemic reported the concern with the children's health due to the reduction of physical activity in this period with an undetermined time of social distancing (Hemphill et al., 2020). Therefore, the literature shows a pattern of decreasing physical activity during the pandemic, which may be due to the closing of schools and the social distance.

One of the possible negative implications regarding decreased physical activity is quality of life, a relationship that has already been widely discussed in the literature (Marker et al., 2018; Salvini et al., 2018; Wu et al., 2017). A systematic review pointed out that higher levels of physical activity were associated with a better HQOL, and even suggested that the higher the frequency, the greater the gain (Marker et al., 2018). In agreement, the study indicated a small, but positive effect of physical activity on children's quality of life and indicated that intensity, frequency, and duration can act as moderators in this relationship (Marker et

al., 2018). Specifically, during the beginning of pandemic period, only one study that considered the relationship between physical activity and quality of life was found, indicating that patients diagnosed with suspected COVID-19 symptoms had a higher quality of life when they practiced physical activity (Nguyen et al., 2020). These relationships can be explained by mediators and moderators speculated in the literature. Participation in sports and games can contribute for a better relationship with peers and thus, be accepted in the environment in which they live, being more active with their friends (Hilland et al., 2011; Lemes, Gaya, et al., 2020). Also, the physical activity practice can increase physical self-perception, social connections, mood, and emotions, consequentially impacting on HQOL (Lubans et al., 2016).

Our results also showed that the relationships vary according to sex. The motive for this can regarding self-perception about the body composition and the self-reported domains of HQOL for girls as the physical well-being evaluated in the present study. It appears that girls are affected in a higher proportion than boys by body changes in the transition from childhood to adolescence (Falconi et al., 2019; Piola et al., 2019). During the school period, the weekly hours spent on sports were associated with all subscales and the total quality of life for girls, and scores on the physical and social functioning subscales for boys. A study shows a similar view, indicating that the maturation moderates the relationship between social functioning and physical activity in boys and girls at these ages. Boys have more social support than girls to play sports and have better self-perception than girls (Falconi et al., 2019; Lemes et al., 2021a; Lemes et al., 2022; Piola et al., 2019).

Another study indicated the same pattern in Iranian adolescents (Jalali-Farahani et al., 2016). However, during the vacation period, which can be considered more similar to the current scenario, the only relationship found for girls was with social functioning and, for boys, physical functioning, emotional functioning, social functioning and total scores for quality of life, getting very close to our findings (Jalali-Farahani et al., 2016). Likewise, a study with Australian children and adolescents pointed out that the practice of sports was considered an important aspect for better scores of physical, mental well-being, and general quality of life in boys. For girls, in addition to the sport being associated with the

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general quality of life and physical well-being, it was also related to active commuting (Tsiros et al., 2017).

Our study brings new evidence regarding the relationship between physical activity and health of children and adolescents during the pandemic COVID-19. Furthermore, according to our knowledge, this is the first study that assesses the relationship between physical activity and the quality of life of Brazilian children and adolescents in the period of social distancing. Present findings are important in order to reinforce that the regular practice of physical activity may lead to beneficial consequences for health and quality of life in youth, even when facing a challenging reality. However, some limitations must be considered. The sample was selected by convenience, and the evaluation of physical activity was performed subjectively, which could intervene in the results. Furthermore, this is a cross-sectional study that does not allow a cause-effect relationship. Also, children were evaluated during the beginning of the pandemic period, which could intervene on the results, although we highlight that the first weeks of social distancing could be the ones that caused more impact, due to the change in daily routine, representing an appropriate period for developing present research. Thus, based on our data and research already carried out, we reinforce that it is time for health care and interventions to be developed remotely to minimize the family risk of inappropriate lifestyles, such as sedentary time, physical inactivity, stress, depression, and anxiety (Galea et al., 2020; Rundle et al., 2020; Wang et al., 2020). In this sense, physical activity by remote form in physical education classes can provide better physical, psychological, and general life well-being for children.

CONCLUSIONS

In conclusion, physical activity was positively associated with the quality of life of children and adolescents during social distance due to the COVID-19. These findings show the importance of this population to remain physically active so that health parameters are not affected during this period. Furthermore, it reinforces the need for remote interventions to be carried out with the help of technologies, aiming to maintain healthy habits.

PRACTICAL APPLICATIONS

The present study showed that children and adolescents who reach a high number of days by week practicing MVPA present most well-being and HQOL in several domains including psychological indicators. It is occurred even at social distancing at home during pandemic COVID-19 in the year 2020. Sports practice is one of the main kinds of interventions for this population to achieve MVPA, and improve HQOL mainly the in psychological, mental and emotional aspects (Jodra et al., 2019; Lemes, Gaya, et al., 2020; Suárez & Jiménez, 2021). In practical terms, there is a need to adapt remote physical education classes and sports promotion for difficult times likely social distancing at home. For example, the physical education lessons by electronic and digital means are forms to promote better moments of well-being and MVPA if they have help of best friends (Monteiro et al., 2021), in another words, adolescents need the social support to have more HQOL and physical activity. It is very pertinent for children and adolescents maintaining the social, physical, and psychological well-being and mental health.

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