

**Citation:**

Meza S, Meza S. Physical activity and quality of life in schoolchildren during the COVID-19 pandemic, Cañete, Peru. *Revista de Investigación (de la Universidad Norbert Wiener)*. 2023; 12(1): a0015.

doi: <https://doi.org/10.37768/unw.rinv.12.01.a0015>

Article received: 02/12/2022

Peer reviewed

Article accepted: 03/01/2023

Article published: 17/03/2023

 **Sagmer Galois Meza Ramírez<sup>1,\*</sup>**

sagmer.meza@upsjb.edu.pe

 **Sagmer Gauss Meza Ramírez<sup>1</sup>**

atilaz\_15@hotmail.com

<sup>1</sup>Universidad Privada San Juan

Bautista. Lima, Perú.

\* Autor corresponsal

# Physical activity and quality of life in schoolchildren during the COVID-19 pandemic, Cañete, Peru

## Actividad física y calidad de vida en escolares durante la pandemia de COVID-19, Cañete, Perú

### ABSTRACT

The COVID-19 pandemic has led to health measures that generate the adoption of more sedentary lifestyles that may have an impact on the quality of life of schoolchildren. The objective of the study was to determine the relationship between the level of physical activity and the quality of life of schoolchildren during the COVID-19 pandemic. The method used was observational, correlational, and cross-sectional, and it was carried out in a school in the province of Cañete, in Peru. The study included 183 female schoolchildren aged 15 to 17 years. Physical activity was measured with the short version of the IPAQ questionnaire and quality of life with the KIDSCREEN-27 questionnaire. The relationship between the variables was determined using Spearman's Rho statistic. The results showed a high level of physical activity (52.5%), but a low level of quality of life (51.9%). In the correlational analysis, physical activity was positively related to overall quality of life ( $Rho = 0.183$ ;  $p = 0.018$ ) and to the domains physical well-being ( $Rho = 0.289$ ,  $p = 0.000$ ), psychological well-being ( $Rho = 0.181$ ,  $p = 0.014$ ), social support and friends ( $Rho = 0.149$ ,  $p = 0.044$ ) and school environment ( $Rho = 0.175$ ,  $p = 0.018$ ), but it was not related to the domain autonomy and relationship with parents ( $Rho = 0.019$ ,  $p = 0.800$ ). It is concluded that schoolchildren who engage in regular physical activity show a weak increase in their corresponding quality of life level.

**Keywords:** physical activity, physical exercise, coronavirus infections, students (MeSH-NLM)



© Los autores, 2023. Publicado por la Universidad Norbert Wiener (Lima, Perú)

## RESUMEN

La pandemia de COVID-19 ha llevado a tomar medidas sanitarias y a la adopción de estilos de vida más sedentarios que pueden repercutir en la calidad de vida de los escolares. El objetivo del estudio fue determinar la relación entre el nivel de actividad física y la calidad de vida de los escolares durante la pandemia de COVID-19. El método utilizado fue observacional, correlacional y transversal, y se aplicó en un colegio de la provincia de Cañete, en Perú. Se incluyó a 183 escolares del sexo femenino y de 15 a 17 años. La actividad física fue medida con la versión corta del cuestionario IPAQ y la calidad de vida mediante el cuestionario KIDSCREEN-27. La relación entre las variables se determinó mediante el estadístico Rho de Spearman. Los resultados evidenciaron un nivel elevado de actividad física (52,5%), pero un bajo nivel de calidad de vida (51,9%). En el análisis correlacional, la actividad física se relacionó positivamente con la calidad de vida global (Rho = 0,183,  $p = 0,018$ ) y con los dominios bienestar físico (Rho = 0,289,  $p = 0,000$ ), bienestar psicológico (Rho = 0,181,  $p = 0,014$ ), apoyo social y amigos (Rho = 0,149,  $p = 0,044$ ) y entorno escolar (Rho = 0,175,  $p = 0,018$ ); pero no se relacionó con el dominio autonomía y relación con los padres (Rho = 0,019,  $p = 0,800$ ). Se concluye que los escolares que realizan actividad física de manera regular presentan un aumento débil de su nivel de calidad de vida correspondiente.

**Palabras clave:** actividad física, ejercicio físico, infecciones por coronavirus, estudiantes (DeCS-BIREME)

## INTRODUCTION

The COVID-19 pandemic that started in the city of Wuhan (China) represents a public health problem in the international context, which has led to the collapse of health systems and has had a great political, social and economic cost worldwide <sup>(1, 2)</sup>. On this basis, several countries established health measures such as social isolation, distancing and mandatory quarantine, with the purpose of controlling the spread of the SARS-CoV-2 virus among the population <sup>(3)</sup>.

Nevertheless, compliance with sanitary measures led to drastic changes in the lifestyle habits of people around the world, with the adoption of more sedentary lifestyles due to the limited activity allowed outside the home. Besides, work and educational activities have been adapted to a remote modality, which has caused an increase in screen time and a decrease in physical activity (PA) <sup>(4, 5)</sup>.

In this sense, low levels of PA already constituted a global public health problem in 2019, since more than a quarter of the adult population did not meet the minimum recommendations established by the World Health Organization (WHO) <sup>(6)</sup>. Similarly, in Peru, it was evidenced in 2017 that more than 70% of the population presented low levels of PA. Even though this problem is more common in adults <sup>(7)</sup>, children and adolescents are not exempt from this condition, since, in a study conducted in 3 cities in Peru, it was evidenced that 50% of schoolchildren did not meet the minimum amount of PA recommended by the WHO <sup>(8)</sup>. Likewise, during the pandemic, health measures hampered opportunities to perform PA, which may have affected the quality of life (QOL) of school children and adolescents in different aspects <sup>(9)</sup>.

Quality of life refers to the happiness or satisfaction of an individual in several domains of life that affect or are affected by health <sup>(10)</sup>. During the pandemic, schoolchildren have been exposed to conditions

that worsen their QOL in aspects such as physical well-being <sup>(11)</sup>, psychological well-being <sup>(12)</sup>, environment <sup>(13)</sup> and family and friend support <sup>(14)</sup>. On the other hand, low levels of PA could generate a worsening of QOL, according to previous studies <sup>(15)</sup>.

Some studies have shown the relationship between PA and QOL domains in children and young people, based on aspects such as physical and mental state, family environment, social support from friends, and the school environment. This background allows us to understand the interaction that QOL could have with the type of lifestyle adopted by schoolchildren, according to the most frequent data available in the literature <sup>(16,17)</sup>.

In Peru, there have been few studies carried out regarding the relationship between PA and the domains of QOL, especially with regard to the school environment, social support and friends, physical and psychological well-being, and autonomy and relationship with parents.

Due to the above and the relevance of the topic, this study had the objective to determine the relationship between PA and QOL in schoolchildren during the COVID-19 pandemic. It is expected that the results will allow us to understand the interaction of PA with QOL domains and thus propose interventions that contribute to reducing the negative impact of the pandemic on the health of school children and young people.

## MATERIALS AND METHOD

This is a cross-sectional observational study of correlational level developed in students of the fifth year of secondary school belonging to the Public Educational Institution Santa Rita de Cassia, in the province of Cañete, Peru, who were taking their classes remotely during the COVID-19 pandemic, specifically between the months of October and November 2021.

The study included 183 female schoolchildren who met the inclusion and exclusion criteria through a non-probabilistic census sampling. The inclusion criterion was the informed consent of parents and

schoolchildren, while the exclusion criterion was the presence of a history of psychiatric illness or physical disability that limited the performance of PA.

Initially, to collect the information, a sociodemographic data form was used, and PA was assessed using the short version of the IPAQ questionnaire<sup>(18)</sup>, which measured the vigorous, moderate and walking intensity PA performed in the last 7 days. Such instrument consists of seven items that indicate the total energy expenditure expressed in MET, and categorizes as high level the total expenditure equal to or greater than 3000 MET in the last 7 days or the expenditure of 1500 MET for 3 or more days performing exclusively vigorous intensity PA; it categorizes as Moderate level the minimum total expenditure of 600 MET for 5 or more days; and categorizes as Low level the total expenditure that did not meet the above criteria <sup>(18)</sup>.

The QOL was assessed by means of the KIDSCREEN-27 questionnaire <sup>(19)</sup>, which is composed of twenty-seven items and five domains: physical well-being, psychological well-being, school environment, social support and friends, autonomy and relationship with parents. Each question has a Likert scale ranging from 1 (never) to 5 (always), and gives an overall score categorized in 3 levels, the Moderate level of which is located between 87 and 106 points <sup>(19)</sup>. Also, the reliability of the questionnaires was determined in 26 schoolchildren through the test-retest stability test ( $Rho = 0.586$ ,  $p = 0.002$ ) and Cronbach's alpha (0.915), respectively. Data collection was carried out virtually using the Google Forms application.

After data collection, a database was created in Excel and then transferred to the IBM SPSS version 25 statistical program. For the descriptive analysis, frequencies and percentages were calculated for the categorical variables shown in tables. For the inferential analysis, the Spearman's Rho nonparametric test was used to analyze the correlation between the PA and QOL variables. Finally, the study was reviewed and approved by the Institutional Research Ethics Committee of Universidad Privada San Juan Bautista, through Resolution No. 446-2021-CIEI-UPSJB.

## RESULTS

Participants were composed of 183 female schoolchildren and the mean age was  $16 \pm 1$  years. 52.5% of them presented a high level of PA and 51.9% reported low levels of QOL. Regarding the QOL domains, physical well-being showed a moderate level in 45.4%, but the psychological well-being, autonomy and relationship with parents, and social support and friends domains were low (62.3%, 47.5% and 68.9%, respectively), while the school environment domain was high (40.4%) (Table 1).

**Table 1.** Physical activity and quality of life levels

Characteristics	n (%)
<b>Physical activity</b>	
Low	10 (5.5)
Moderate	77 (42.1)
High	96 (52.2)
<b>Quality of life</b>	
Low	95 (51.9)
Moderate	60 (32.8)
High	28 (15.3)
<b>Physical well-being</b>	
Low	38 (20.8)
Moderate	83 (45.4)
High	62 (33.9)
<b>Psychological well-being</b>	
Low	114 (62.3)
Moderate	43 (23.5)
High	26 (14.2)
<b>Autonomy and relationship with parents</b>	
Low	87 (47.5)
Moderate	74 (40.4)
High	22 (12.0)
<b>Social support and friends</b>	
Low	126 (68.9)
Moderate	39 (21.3)
High	18 (9.8)
<b>School environment</b>	
Low	50 (27.3)
Moderate	59 (32.2)
High	74 (40.4)

With regard to the inferential analysis, it was shown that QOL ( $Rho = 0.175$ ,  $p = 0.018$ ) and its domains physical well-being ( $Rho = 0.289$ ,  $p = 0.000$ ), psychological well-being ( $Rho = 0.181$ ,  $p = 0.014$ ), social support and friends ( $Rho = 0.149$ ,  $p = 0.044$ ) and school environment ( $Rho = 0.239$ ,  $p = 0.001$ ) were positively related to PA; however, the domain autonomy and relationship with parents ( $Rho = 0.019$ ,  $p = 0.800$ ) did not present a significant relationship with PA (Table 2).

**Table 2.** Correlation between physical activity and quality of life

Variable	Physical activity	
	Correlation*	p-value
Quality of life	0.175	0.018
Physical well-being	0.289	0.000
Psychological well-being	0.181	0.014
Autonomy and relationship with parents	0.019	0.800
Social support and friends	0.149	0.044
School environment	0.239	0.001

\*Spearman's Rho correlation test

## DISCUSSION

Lifestyle is a crucial decisive factor that conditions the health of the population <sup>(20)</sup> and in which PA plays an essential role, since it prevents noncommunicable diseases and positively influences the physical and mental health of individuals; therefore, its poor practice could have an impact on the well-being of children and young people <sup>(6)</sup>. In this study, PA was significantly related to QOL in students, which allows to confirm a physically active lifestyle as a decisive factor for the QOL of schoolchildren exposed to more sedentary behaviors because of the health restrictions imposed during the COVID-19 pandemic <sup>(3)</sup>.

During the study, more than half of the students presented elevated levels of PA, which would indicate that the majority had adopted mechanisms to remain physically active during the pandemic; however, this result does not agree with other studies that show a

drastic decrease in PA due to health restrictions (4, 5). This difference could be explained by the different contextual conditions in which the studies were conducted, since this study was carried out in the middle of 2021, when restrictions were less severe, which allowed for greater displacement outside the home (21).

With regard to QOL, more than half of the schoolgirls showed low levels overall and in the domains of psychological well-being, social support and friends, and autonomy and relationship with parents, which would indicate that the pandemic has affected students in different aspects. This result agrees with studies that found a worsening of the QOL of schoolchildren during compulsory quarantine, which is a relevant current public health problem (22, 23).

The study found that PA was positively related to the physical well-being domain, so that students with high levels of PA could be expected to have a high level of physical well-being. This result is similar to that of some studies that state that physically active schoolchildren present a better state of physical well-being compared to physically inactive schoolchildren (24-26). This relationship could be explained by the similarity of the items, since the physical well-being domain includes those related to feeling fit, being physically active and feeling full of energy, similar to those that compose the PA.

Likewise, the psychological well-being domain was positively related to PA, which would indicate that students with higher levels of PA could present a higher level of psychological well-being, a result similar to previous studies in which it is indicated that children and young people who present a better state of psychological well-being perform PA on a regular basis (25). However, these findings differ from the ones obtained in research that state that PA is not associated with psychological components (24, 27), a difference that could be explained by the different QOL measurement instruments used, since they include different items from the ones in this study.

On their part, the autonomy and relationship with parents domain was not significantly related to PA, which suggests that the relationship between

the student and the parents would not be a determining factor in the PA levels. This agrees with some studies that indicate that there is no correspondence between PA and the bond that schoolchildren have with their parents (26, 27). However, these results differ from another in which students who had physically active parents tended to have the same lifestyle (24). This difference could be due to the different contexts in which the studies were conducted, as the pandemic has significantly changed lifestyles around the world.

The social support and friends domain was positively related to PA, so it could be expected that students who perceive the support of their closest friends would present higher levels of PA, which is consistent with two studies that indicate that close friends influence the intention to perform PA (25, 28). Therefore, health promotion strategies should consider the socialization and integration of schoolchildren to favor the acquisition of active lifestyles.

The school environment domain was positively related to PA, which suggests that the attitude presented by the students towards their school could condition the performance of PA, which is consistent with previous studies that state that schoolchildren with a positive attitude towards school have higher levels of PA (24, 25). Accordingly, PA promotion strategies should consider the attitude that schoolchildren have towards their school, in such a way as to guarantee the acquisition of active lifestyles in schoolchildren.

On the other hand, the study had some limitations: the results were obtained from a population of female schoolchildren, so the behavior of the variables in populations of different genders is not described; in addition, the cross-sectional design does not allow causality to be determined. In spite of this, the study is one of the first in Peru to describe PA and QOL in schoolchildren, which provides valuable information on the state of well-being of students during the COVID-19 pandemic.

In conclusion, schoolchildren who regularly perform PA show a weak increase in the level of quality of life. In this sense, health promotion strategies addressed at school population should consider these aspects.



**Authors' contributions:** Sagmer Galois Meza Ramírez and Sagmer Gauss Meza Ramírez wrote, reviewed, and approved the final version of the paper.

**Potential conflicts of interest:** The authors declare that they have no conflicts of interest. **Funding:** The study was self-financed.

**Corresponding author:** Sagmer Galois Meza Ramírez,  
sagmer.meza@upsjb.edu.pe

## BIBLIOGRAPHICAL REFERENCES

1. Pan American Health Organization. La Organización Mundial de la Salud caracteriza al COVID-19 como una pandemia. Geneva: WHO; 2020 [cited November 08, 2021]. Available in: <https://www.paho.org/es/noticias/11-3-2020-oms-caracteriza-covid-19-como-pandemia>
2. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *Int J Surg.* 2020; 78(1): 185-93. doi: [10.1016/j.ijssu.2020.04.018](https://doi.org/10.1016/j.ijssu.2020.04.018)
3. World Health Organization. Criterios de salud pública para ajustar las medidas de salud pública y sociales en el contexto de la COVID-19: anexo del documento Consideraciones relativas a los ajustes de las medidas de salud pública y sociales en el contexto de la COVID-19. Geneva: WHO; 2020. Available in: <https://apps.who.int/iris/handle/10665/332169>
4. Rahman E, Islam S, Bishwas S, Moonajilin S, Gozal D. Physical inactivity and sedentary behaviors in the Bangladeshi population during the COVID-19 pandemic: An online cross-sectional survey. *Heliyon.* 2020; 6(10): 1-8. doi: [10.1016/j.heliyon.2020.e05392](https://doi.org/10.1016/j.heliyon.2020.e05392)
5. Novikov P. Impact of COVID-19 emergency transition to on-line learning on international students. Perceptions of educational process at Russian University. *J Soc Stud Educ Res.* 2020; 11(3): 270-302. Available in: <https://jsser.org/index.php/jsser/article/view/2602>
6. World Health Organization. Actividad física. Geneva: WHO; 2020 [cited November 09, 2021]. Available in: <https://www.who.int/es/news-room/fact-sheets/detail/physical-activity>
7. Tarqui C, Álvarez D, Espinoza P. Prevalencia y factores asociados a la baja actividad física de la población peruana. *Nutr Clin y Diet Hosp.* 2017; 37(4): 108-15. doi: [10.12873/374tarqui](https://doi.org/10.12873/374tarqui)

8. Alvis-Chirinos K, Huamán-Espino L, Pillaca J, Aparco J. Medición de la actividad física mediante acelerómetros triaxiales en escolares de tres ciudades del Perú. *Rev Peru Med Exp Salud Publica*. 2017; 34(1): 28-35. doi: [10.17843/rpmesp.2017.341.2764](https://doi.org/10.17843/rpmesp.2017.341.2764)
9. Kang S, Sun Y, Zhang X, Sun F, Wang B, Zhu W. Is physical activity associated with mental health among chinese adolescents during isolation in COVID-19 pandemic? *J Epidemiol Glob Health*. 2021; 11(1): 26-33. doi: [10.2991/jegh.k.200908.001](https://doi.org/10.2991/jegh.k.200908.001)
10. Evans D. Enhancing quality of life in the population at large. *Soc Indic Res*. 1994; 33(1): 47-88. doi: [10.1007/BF01078958](https://doi.org/10.1007/BF01078958)
11. Genta F, Rodrigues G, Velletri J, Porto J, Dallago A, Moreno C, et al. COVID-19 pandemic impact on sleep habits, chronotype, and health-related quality of life among high school students: A longitudinal study. *J Clin Sleep Med*. 2021; 17(7): 1371-7. doi: [10.5664/jcsm.9196](https://doi.org/10.5664/jcsm.9196)
12. Myhr A, Renée L, Samarawickrema I, Vesterbekkmo R. Impact of COVID-19 Pandemic Lockdown on Mental Well-Being of Norwegian Adolescents During the First Wave-Socioeconomic Position and Gender Differences. *Front Public Heal*. 2021; 9(1): 1-12. doi: [10.3389/fpubh.2021.717747](https://doi.org/10.3389/fpubh.2021.717747)
13. Kotarska K, Paczyńska-Jędrycka M, Sygit K, Kmiec K, Czerw A, Nowak M. Physical activity and the quality of life of female students of universities in Poland. *Int J Environ Res Public Health*. 2021; 18(10): 1-13. doi: [10.3390/ijerph18105194](https://doi.org/10.3390/ijerph18105194)
14. Khan A. Impact of COVID-19 pandemic and subsequent lockdown on quality of life of high-school students. *Pakistan J Med Heal Sci*. 2020; 14(4): 997-9. Available in: <https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/en/covidwho-1037812>
15. Qin Z, Wang N, Ware R, Sha Y, Xu F. Lifestyle-related behaviors and health-related quality of life among children and adolescents in China. *Health Qual Life Outcomes*. 2021; 19(1): 1-9. doi: [10.1186/s12955-020-01657-w](https://doi.org/10.1186/s12955-020-01657-w)
16. Murphy M, Carlin A, Woods C, Nevill A, MacDonncha C, Ferguson K, et al. Active students are healthier and happier than their inactive peers: The results of a large representative cross-sectional study of university students in Ireland. *J Phys Act Heal*. 2018; 15(10): 737-46. doi: [10.1123/jpah.2017-0432](https://doi.org/10.1123/jpah.2017-0432)

17. Lima-Serrano M, Martínez-Montilla J, Guerra-Martín M, Vargas-Martínez A, Lima-Rodríguez J. Factores relacionados con la calidad de vida en la adolescencia. *Gac Sanit.* 2018; 32(1): 68-71. doi: [10.1016/j.gaceta.2016.06.016](https://doi.org/10.1016/j.gaceta.2016.06.016)
18. Mantilla S, Gómez-Conesa A. El Cuestionario Internacional de Actividad Física. Un instrumento adecuado en el seguimiento de la actividad física poblacional. *Rev Iberoam Fisioter y Kinesiología.* 2007; 10(1): 48-52. doi: [10.1016/S1138-6045\(07\)73665-1](https://doi.org/10.1016/S1138-6045(07)73665-1)
19. Mercado E. Propiedades psicométricas del Cuestionario de calidad de vida relacionada con la salud KIDSCREEN-27 en adolescentes del distrito de Trujillo [Doctoral Thesis]. Lima: Universidad César Vallejo; 2020. Available in: <https://repositorio.ucv.edu.pe/handle/20.500.12692/44640>
20. Lalonde M. A new perspective on the health of Canadians. Ottawa: Minister of Supply and Services Canada; 1974. Available in: <https://nccdh.ca/resources/entry/new-perspective-on-the-health-of-canadians>
21. Decreto Supremo N.º 167-2021-PCM, del 29 octubre, que prorroga el Estado de Emergencia Nacional. (Diario Oficial El Peruano, 30 October 2021). Available in: <https://www.gob.pe/institucion/pcm/normas-legales/2302257-167-2021-pcm>
22. Riiser K, Helseth S, Haraldstad K, Torbjørnsen A, Richardsen K. Adolescents health literacy, health protective measures, and health-related quality of life during the COVID-19 pandemic. *PLoS One.* 2020; 15(8): 1-13. doi: [10.1371/journal.pone.0238161](https://doi.org/10.1371/journal.pone.0238161)
23. Ferreira L, Pereira L, Brás M, Ilchuk K. Quality of life under the COVID-19 quarantine. *Qual Life Res.* 2021; 30(5): 1389-405. doi: [10.1007/s11136-020-02724-x](https://doi.org/10.1007/s11136-020-02724-x)
24. Rodríguez J, Iglesias Á, Molina J. Evaluación de la práctica de actividad física, la adherencia a la dieta y el comportamiento y su relación con la calidad de vida en estudiantes de Educación Primaria. *Retos.* 2019; 38(2): 129-36. doi: [10.47197/retos.v38i38.73921](https://doi.org/10.47197/retos.v38i38.73921)
25. Motamed-Gorji N, Qorbani M, Nikkho F, Asadi M, Esmaeil M, Safari O, et al. Association of screen time and physical activity with health-related quality of life in Iranian children and adolescents. *Health Qual Life Outcomes.* 2019; 17(2): 1-11. doi: [10.1186/s12955-018-1071-z](https://doi.org/10.1186/s12955-018-1071-z)



26. Andersen J, Karin G, Aadland E, Fusche V, Kolotkin R, Andersen S, et al. Associations between health-related quality of life, cardiorespiratory fitness, muscle strength, physical activity and waist circumference in 10 year old children: the ASK study. Springer Int Publ AG. 2017; 1(1): 3-6. doi: [10.1007/s11136-017-1634-1](https://doi.org/10.1007/s11136-017-1634-1)
27. Bernardino J, Calabuig V, Gómez-Mármol A, Valero A, Asencio M. Nivel de actividad física y calidad de vida relacionada con la salud en estudiantes. Acción Motriz. 2018; 21(1): 7-14. Available in: <https://dialnet.unirioja.es/servlet/articulo?codigo=6597289>
28. Franco-Arévalo D, Cruz-Sánchez E. La influencia de los padres e iguales en la realización de actividad físico-deportiva de los escolares de educación primaria. J Sport Sci. 2017; 13(3): 263-72. Available in: <https://dialnet.unirioja.es/servlet/articulo?codigo=6291285>