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Title:

Concern about the potential environmental impact of a large-scale war among Latin American adults

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Abstract

Background: Large-scale armed conflicts can cause substantial environmental damage, with consequences for ecosystems, infrastructure, and population health. However, little is known about concern regarding these potential impacts among Latin American populations. **Objective:** To determine the factors associated with concern about the potential environmental impact of a large-scale war among Latin American adults. **Methods:** A multi-country cross-sectional survey was conducted among adults residing in Latin American countries. Concern about the environmental impact of a possible large-scale war was assessed using a study-specific question; the survey was conducted during the early weeks of the Russia-Ukraine war, but the outcome referred to concern about a possible large-scale war rather than to that conflict alone. Associations with symptoms of anxiety, depression, and stress measured with the DASS-21, used here as indicators of general psychological symptoms rather than conflict-specific effects, as well as sociodemographic characteristics, were then analyzed.. Generalized linear models with Poisson distribution, log link,

and robust variance were used to estimate prevalence ratios (PRs) and 95% confidence intervals (95% CIs). **Results:** Among 2,669 respondents, 55% reported concern about the environmental consequences of a possible large-scale war. In multivariable analysis, concern was higher among participants with moderate or greater stress (PR: 1.16; 95% CI: 1.04-1.28) and among those residing in Argentina (PR: 1.79; 95% CI: 1.44-2.21). Concern was lower among men (PR: 0.78; 95% CI: 0.72-0.85) and among participants with technical education (PR: 0.81; 95% CI: 0.67-0.99). **Conclusion:** A substantial proportion of respondents expressed concern about the potential environmental consequences of a large-scale war. This concern was associated with stress and selected sociodemographic factors. These findings provide exploratory evidence on war-related environmental risk perception in Latin America.

Keywords

Environmental concern; risk perception; war; Latin America; stress; cross-sectional study

Introduction

Armed conflicts can generate severe and long-lasting environmental damage through destruction of infrastructure, contamination of soil and water, disruption of sanitation systems, biodiversity loss, and greenhouse gas emissions, with downstream consequences for population health and ecological stability [1–4]. These risks may be amplified in large-scale conflicts because of the broader geographic scope of destruction, the

involvement of multiple state actors, and the potential use of highly destructive weaponry [5–7]. Historical and contemporary conflicts have illustrated these environmental consequences, including oil spills and air pollution during the Gulf War and widespread environmental damage documented during the Russia-Ukraine war [8]. Recent conflicts in the Middle East have further highlighted the environmental consequences of war. UNEP assessments in Gaza have documented extensive damage to soil, freshwater resources, coastal ecosystems, wastewater infrastructure, and air quality, as well as large-scale debris generation and contamination risks. More broadly, escalating regional hostilities, including those involving Iran and Israel, underscore how armed conflict may create immediate and long-term environmental hazards through damage to critical infrastructure, pollution, and risks to water security, public health, and ecological recovery [9–11].

Understanding how populations perceive the environmental consequences of war is relevant for public health because risk perception may shape emotional responses, social attitudes, and support for prevention or mitigation measures. This issue is particularly relevant in Latin America, a region with marked environmental vulnerability and substantial ecological importance [12, 13]. In addition, international conflicts may be perceived as having indirect consequences for countries outside the war zone, including political alignment, economic disruption, and environmental spillover effects [14, 15]. Although the survey was administered during the early weeks of the Russia-Ukraine war, the main outcome was not intended to assess perceptions of that specific conflict alone. Instead, the questionnaire asked about concern regarding the environmental consequences of a possible

large-scale war, using the Russia-Ukraine context as the broader temporal backdrop in which the survey was conducted.

Although some studies in Latin America have examined environmental perceptions and climate change concern [16, 17], evidence remains scarce regarding public concern about the environmental consequences of large-scale armed conflict, particularly in relation to sociodemographic and psychological factors. This represents an important knowledge gap, as such perceptions may vary across countries and population subgroups. Therefore, this study aimed to identify factors associated with concern about the potential environmental consequences of a large-scale war among adults residing in Latin American countries.

Methods

Design and Population

A multi-country cross-sectional survey was conducted using an online questionnaire distributed among adults residing in Latin American countries, including Colombia, Paraguay, Peru, Bolivia, Ecuador, Mexico, Panama, Brazil, and Argentina. The survey was administered during the initial weeks of the Russia-Ukraine conflict, specifically between the second and ninth weeks after its onset. Although data collection occurred during that period, the main study question referred to concern about the environmental impact of a possible large-scale war rather than to perceptions of the Russia-Ukraine war as a single military event.

Eligible participants were adults who reported residing in one of the study countries and who provided informed consent before completing the survey. Participants were recruited through non-probability snowball sampling: the survey link was initially shared with eligible individuals and then forwarded through their social networks. Because recruitment was conducted online and through participant referral, the sample should be interpreted as a convenience sample rather than a representative sample of the general population.

The study protocol was reviewed and approved by the Ethics Committee of the Universidad Privada Antenor Orrego (Approval No. 0417-2022-UPAO). Because the survey was anonymous from the outset, with no possibility of identifying respondents, and data were not collected through any specific institution in each participating country, additional local ethics approvals were not required. This study was based on secondary analysis of data collected in a previous investigation [18].

Data were compiled and quality-checked by the authors before being exported for statistical analysis in Stata version 18.

The primary outcome was assessed using a single study-specific item designed to evaluate concern about the potential environmental impact of a large-scale war. The item was: “Is the environment a concern in the event of a large-scale war?”, with five response options: strongly disagree, disagree, indifferent, agree, and strongly agree. For analysis, the outcome was

dichotomized as agree/strongly agree versus strongly disagree/disagree/indifferent.

The main independent variables were symptoms of anxiety, depression, and stress, measured using the Depression, Anxiety and Stress Scale-21 (DASS-21), a previously published instrument [19]. The DASS-21 was used to assess general symptoms in these domains and does not identify their specific cause. In the present study, these variables were analyzed as psychological correlates of concern about the environmental consequences of a possible large-scale war, rather than as effects attributable to a specific armed conflict. For analytical purposes, each DASS-21 domain was categorized as normal/mild versus moderate or greater. Sociodemographic covariates were collected through direct survey questions and included sex, age (in completed years), country of residence, educational level (secondary, technical, university, and postgraduate), and occupation (employees/dependents, students, unemployed individuals, homemakers, retirees, and independent workers).

Data Analysis

The distribution of the outcome variable was first described. Categorical variables were summarized using frequencies and percentages, and age was summarized using medians and interquartile ranges. Group differences were assessed using the chi-square test for categorical variables and the Wilcoxon rank-sum test for age. Bivariable and multivariable analyses were then conducted using generalized linear models from the Poisson family with log link and robust variance estimators. These models were used to estimate

prevalence ratios (PRs), 95% confidence intervals (95% CIs), and p-values, rather than odds ratios or prevalence rates. The multivariable model included sociodemographic and psychological variables considered relevant based on the study objective and prior conceptual considerations. Statistical significance was defined as a two-sided p-value <0.05. No missing data were identified in the variables included in the present analysis; therefore, complete-case analysis was performed.

Results

Of the 2,669 participants, 25% strongly agreed, 30% agreed, 15% were indifferent, 13% disagreed, and 17% strongly disagreed with the statement assessing concern about the environmental impact of a large-scale war.

Higher concern about the environmental impact of a potential large-scale war was observed among women, younger participants, and according to country of residence, educational level, occupation, and the presence of moderate or greater anxiety, depression, and stress symptoms (all p<0.05) (Table 1).

Table 1. Factors associated with concern about the environmental impact of a potential large-scale war among Latin American respondents.

Variables	**Is the environment a concern during wartime?**		***p-value***
	No n (%)	**Yes (%)**	

Sex			
Female	633 (38.6)	1005 (61.4)	<0.001
Male	558 (54.1)	473 (45.9)	
Age (years)[a]	24 (21-30)	23 (20-27)	<0.001
Country			
Others	47 (49.0)	49 (51.0)	<0.001
Colombia	272 (45.4)	327 (54.6)	
Paraguay	169 (40.4)	249 (59.6)	
Peru	202 (51.3)	192 (48.7)	
Bolivia	138 (42.2)	189 (57.8)	
Ecuador	107 (43.5)	139 (56.5)	
Mexico	96 (47.8)	105 (52.2)	
Panama	90 (49.2)	93 (50.8)	
Brazil	61 (45.5)	73 (54.5)	
Argentina	9 (12.7)	62 (87.3)	
Education level			
Up to secondary school	122 (44.0)	155 (56.0)	<0.001

Technicians	95 (55.9)	75 (44.1)	
University students	828 (42.6)	1116 (57.4)	
Postgraduate	146 (52.5)	132 (47.5)	
Occupation			
Employees/dependents	289 (51.1)	277 (48.9)	<0.001
Students	665 (41.3)	945 (58.7)	
Unemployed	44 (47.8)	48 (52.2)	
Housewives	32 (41.6)	45 (58.4)	
Retirees	22 (52.4)	20 (47.6)	
Independents	139 (49.3)	143 (50.7)	
Anxiety			
Normal or low	881 (47.2)	984 (52.8)	<0.001
Moderate or greater	310 (38.6)	494 (61.4)	
Depression			
Normal or low	923 (46.5)	1061 (53.5)	<0.001
Moderate or greater	268 (39.1)	417 (60.9)	
Stress			

Normal or low	1031 (46.8)	1170 (53.2)	<0.001
Moderate or greater	160 (34.2)	308 (65.8)	

The p-values were obtained using the chi-square test (for categorical variables) and the Wilcoxon rank-sum test (for age). [a]Medians and interquartile ranges are shown.

In the multivariable analysis, greater concern was observed among participants with moderate or greater stress (PR: 1.16; 95% CI: 1.04-1.28; p=0.007) and among those residing in Argentina (PR: 1.79; 95% CI: 1.44-2.21; p<0.001). Conversely, lower concern was observed among men (PR: 0.78; 95% CI: 0.72-0.85; p<0.001) and among those with technical education (PR: 0.81; 95% CI: 0.67-0.99; p=0.037) **(Table 2).**

Table 2. Bivariable and multivariable analyses of factors associated with concern about the environmental impact of a potential large-scale war among Latin American respondents.

Variables	Bivariable	Multivariable
Male sex	0.75 (0.69-0.81)	**0.78 (0.72-0.85)**
	<0.001	**<0.001**
Age (years)[a]	0.993 (0.990-0.997)	1.00 (0.99-1.00)
	0.001	0.146
Country		
Others	Comparison category	Comparison category

Colombia	1.07 (0.87-1.31)	1.04 (0.85-1.28)
	0.529	0.675
Paraguay	1.17 (0.94-1.44)	1.16 (0.95-1.42)
	0.152	0.149
Peru	0.95 (0.77-1.19)	0.98 (0.79-1.21)
	0.681	0.851
Bolivia	1.13 (0.91-1.41)	1.17 (0.95-1.44)
	0.261	0.149
Ecuador	1.11 (0.88-1.39)	1.05 (0.85-1.31)
	0.375	0.655
Mexico	1.02 (0.81-1.30)	1.03 (0.82-1.30)
	0.848	0.784
Panama	1.00 (0.78-1.17)	1.00 (0.79-1.30)
	0.972	0.973
Brazil	1.07 (0.83-1.37)	1.27 (0.98-1.64)
	0.609	0.065
Argentina	1.71 (1.38-2.12)	**1.79 (1.44-2.21)**
	<0.001	**<0.001**
Education level		
Up to secondary school	Comparison category	Comparison category
Technical education	0.79 (0.65-0.96)	**0.81 (0.67-0.99)**
	0.019	**0.037**

University students	1.03 (0.92-1.15)	1.01 (0.90-1.13)
	0.652	0.930
Postgraduate	0.85 (0.72-0.99)	0.96 (0.81-1.14)
	0.047	0.666
Occupation		
Employees/dependents	Comparison category	Comparison category
Students	1.20 (1.09-1.32)	1.11 (0.99-1.24)
	<0.001	0.069
Unemployed	1.07 (0.86-1.32)	0.97 (0.77-1.21)
	0.556	0.778
Housewives	1.19 (0.97-1.47)	1.08 (0.87-1.35)
	0.092	0.480
Retirees	0.97 (0.70-1.35)	1.12 (0.78-1.61)
	0.870	0.539
Independent workers	1.04 (0.90-1.19)	1.03 (0.89-1.19)
	0.625	0.676
Moderate or greater anxiety	1.17 (1.09-1.25)	1.04 (0.94-1.16)
	<0.001	0.389
Moderate or greater depression	1.13 (1.06-1.22)	0.98 (0.88-1.08)
	<0.001	0.648
Moderate or greater stress	1.23 (1.15-1.34)	**1.16 (1.04-1.28)**
	<0.001	**0.007**

[a] Age was analyzed as a continuous variable. Prevalence ratios (PRs), 95% confidence intervals (95% CIs), and p-values were estimated using

generalized linear models from the Poisson family with log link and robust variance estimators. For categorical variables, each estimate was calculated relative to the corresponding comparison category shown in the table.

Discussion

The study found that over half of respondents expressed concern about the environmental impact of a potential large-scale war. Our findings are consistent with those of the 2022 Transatlantic Trends study, which identified war between nations as the foremost concern among respondents, followed by climate change. This underscores the prominence of armed conflict and the threat of large-scale war as critical global issues [20]. Considering the recency of this research and the fact that both topics examined are among the foremost concerns, this elicits significant apprehension.

The potential environmental ramifications of the conflict are exacerbated by the uncertainty surrounding the measures that the nations involved will implement[21]. This matter should continue to be thoroughly investigated, particularly in nations that continually harbor concerns about their military alliances or other minor conflicts they may encounter. The participants with the highest levels of concern had a median age of 23 years. Younger age has been associated in prior studies with greater concern about environmental threats [22]. Similarly, a study by Barchielli found that young adults express greater concern about climate change than older adults [23].

A survey assessing environmental perception, with a Cronbach's alpha of 0.74, revealed significant concern among young individuals about environmental issues. This underscores the importance of fostering commitment and preparing young people as proactive agents in addressing climate change [24]. This should persist in being assessed across diverse populations in this category, where instruments for gauging concern about environmental impact are already in use but have seen limited application within our region.

Men showed lower concern than women. This finding is consistent with previous studies reporting higher environmental concern among women, although the mechanisms underlying this difference remain uncertain and may involve social, cultural, and informational factors. This is corroborated by the findings of Abanoub, where women exhibited the highest frequency of news monitoring and social media engagement, which correlated with increased levels of anxiety and depressive symptoms [25]. Our results are similar to those of another study, which found that young women perceive situations such as pollution, energy misuse, wildfires, and pesticide use as 'serious' or 'very serious'. However, both men and women showed a 'moderate' environmental concern regarding local pollution [23]. Similarly, other studies also report greater environmental concern among women than among men [26–28].

Argentina had the highest percentage of concern for the environment. This finding may reflect contextual differences in environmental awareness or perceived vulnerability, although these explanations were not directly

assessed in the present study [29, 30]. This partly aligns with the results of a study showing that Argentina had greater acceptance of climate change as a problem than other Latin American countries [31]. These countries are categorized as having an ‘extreme risk’ of climate change vulnerability [32].

Additionally, a study by Pew Research Center shows that Latin American countries have a high perception of climate change as a global threat, while countries like the United States, Japan, Russia, and China (which are the most significant contributors to greenhouse gas emissions) have a less developed perception of the issue [26]. This motivates us to replicate the present study, aiming to cover more countries and examine the effects of variables such as socioeconomic level, environmental damage generation, among others. Those with technical education had less concern compared to those with an up-to-date school education. This is important because it shows that educational levels make a difference in the perceptions of the impact of climate change [33]. This result can be explained by the difference in environmental education in relation to the academic degree [34–36]. Since other factors may influence this relationship, it is recommended to explore additional variables, such as the wealth index and knowledge of the topic, among others. Finally, those with moderate to high stress levels showed a more acute perception of the environmental repercussions in the event of a possible war, which may reflect greater sensitivity to perceived threats. Cognitive-rational determinants, affective-emotional factors, behavioral capabilities, personality traits, and situational factors may condition this factor [37, 38].

This study has several limitations. First, the use of non-probability snowball sampling and online recruitment introduces selection bias and limits the generalizability of the findings to the broader Latin American population. Second, the main outcome was measured using a single study-specific item rather than a formally validated scale, which may have introduced measurement limitations. Third, because of the cross-sectional design, the observed associations cannot be interpreted as causal. Fourth, residual confounding cannot be ruled out, particularly because factors such as socioeconomic position, prior exposure to environmental information, and political context were not measured. In addition, the DASS-21 captures general symptoms of anxiety, depression, and stress, but does not establish the causes of those symptoms; therefore, these variables should be interpreted only as associated psychological characteristics within the present analysis. Despite these limitations, the study provides exploratory multicountry evidence on concern about the environmental consequences of war in a Latin American context.

In conclusion, a substantial proportion of Latin American respondents reported concern about the potential environmental consequences of a large-scale war. Higher concern was associated with stress and selected sociodemographic characteristics, particularly sex, country of residence, and educational level. These findings should be interpreted as exploratory, but they suggest that perceptions of war-related environmental harm deserve further study using more representative samples and validated measurement tools.

References

1. Saavedra FE. CRISIS AMBIENTAL Y CAMBIO CLIMÁTICO EN LA POLÍTICA GLOBAL: UN TEMA CRECIENTEMENTE COMPLEJO PARA AMÉRICA LATINA. Universum (Talca). 2010;25:57–77. https://doi.org/10.4067/S0718-23762010000200005.

2. Zhao X, Jiang M, Zhang W. The Impact of Environmental Pollution and Economic Growth on Public Health: Evidence From China. Front Public Health. 2022;10:861157. https://doi.org/10.3389/FPUBH.2022.861157.

3. Ripple WJ, Wolf C, Newsome TM, Barnard P, Moomaw WR. World Scientists' Warning of a Climate Emergency. Bioscience. 2020;70:8–12. https://doi.org/10.1093/BIOSCI/BIZ088.

4. Atwoli L, Baqui AH, Benfield T, Bosurgi R, Godlee F, Hancocks S, et al. Call for emergency action to limit global temperature increases, restore biodiversity, and protect health. Wealthy nations must do much more, much faster. Universitas Medica. 2021;62:1–6. https://doi.org/10.11144/JAVERIANA.UMED62-3.CALL.

5. Méndez F, Zapata AM. Armed conflict, pollution, and health risks: A risk evaluation of three sources of environmental exposure associated with the conflict in Colombia. Biomedica. 2021;41:1–40. https://doi.org/10.7705/BIOMEDICA.5928.

6. Ruiz Vicente MA. Estado actual de la contaminación ambiental presente en la Mixteca Oaxaqueña. J Negat No Posit Results. 2020;5:535–553. doi:10.19230/jonnpr.3257.

7. Green European Journal. Las repercusiones medioambientales de la guerra en Ucrania. 2022. https://www.greeneuropeanjournal.eu/las-repercusiones-medioambientales-de-la-guerra-en-ucrania/. Accessed 2 Jan 2026.

8. Harada KH, Soleman SR, Ang JSM, Trzcinski AP. Conflict-related environmental damages on health: lessons learned from the past wars and ongoing Russian invasion of Ukraine. Environ Health Prev Med. 2022;27:35. https://doi.org/10.1265/EHPM.22-00122.

9. UN Environment Programme. Damage to Gaza causing new risks to human health and long-term recovery - new UNEP assessment. https://www.unep.org/news-and-stories/press-release/damage-gaza-causing-new-risks-human-health-and-long-term-recovery. Accessed 30 Mar 2026.

10. UN Environment Programme. Environmental Impact of the Conflict in Gaza: Preliminary Assessment of Environmental Impacts | UNEP - UN Environment Programme. https://www.unep.org/resources/report/environmental-impact-conflict-gaza-preliminary-assessment-environmental-impacts. Accessed 30 Mar 2026.

11. AP News. Environmental harms and health risks from Iran war could persist for decades | AP News. https://apnews.com/article/iran-war-environmental-destruction-health-risks-8a2fd4fa7e2f96686bc6559e2dade93c. Accessed 30 Mar 2026.

12. Souza MCO, Rocha BA, Adeyemi JA, Nadal M, Domingo JL, Barbosa F. Legacy and emerging pollutants in Latin America: A critical review of occurrence and levels in environmental and food samples. Science of The Total Environment. 2022;848:157774. https://doi.org/10.1016/J.SCITOTENV.2022.157774.

13. Freeland S. Derechos humanos, medio ambiente y conflictos: Enfrentando los crímenes ambientales. Sur Revista Internacional de Direitos Humanos. 2005;2:118–45. https://doi.org/10.1590/S1806-64452005000100006.

14. Alarcón DOH, Chuquihuaccha JT. América Latina frente a la guerra entre Rusia y Ucrania de 2022: una propuesta de categorización de las posturas de política exterior. Política Internacional. 2022;:178–97. https://doi.org/10.61249/PI.VI132.52.

15. Demurtas A. La dimensión nuclear de la guerra en Ucrania: nueva narrativa, poder y orden internacional. Revista Española de Derecho Internacional. 2022;74:23–55. https://doi.org/10.17103/redi.74.2.2022.1a.01.

16. Rodríguez Ulloa C, Rivera Jacinto M. Percepción sobre problemas ambientales en universitarios de ciencias de la salud de Cajamarca. Rev Peru Med Exp Salud Publica. 2009;26:126.

17. Sapiains R, Azocar G, Palomo-Vélez G, Ugarte AM, Aldunce P. Climate change perceptions in Latin America: From regional consensus to sociodemographic differences. Popul Environ. 2024;46. https://doi.org/10.1007/S11111-024-00464-5.

18. Mejia CR, Alvarez-Risco A, Chamorro-Espinoza S, Castillón-Lozano JA, Paucar MC, Padilla-F VJ, et al. Crisis due to war: anxiety, depression and stress in the population of 13 Latin American countries. Front Psychiatry. 2023;14:1218298. https://doi.org/10.3389/FPSYT.2023.1218298/BIBTEX.

19. Román Mella MF, Vinet EV, Alarcón AM. Escalas de Depresión, Ansiedad y Estrés (DASS-21): adaptación y propiedades psicométricas en estudiantes secundarios de Temuco. Rev Argent Clin Psicol. 2014;23:179–190.

20. Mallen RC, Macías AÁ, Coral C, Chávez MVS. Mercado global-efectos locales: Un análisis coyuntural sobre el COVID-19, conflictos bélicos y cambio climático 2020-2022. Sociedades Rurales, Producción y Medio Ambiente. 2022;22:16–16.

21. Organización Panamericana de la Salud. Construir la salud a lo largo del curso de vida. Conceptos, implicaciones y aplicación en la salud pública . 2021. https://www.paho.org/es/documentos/construir-salud-lo-largo-curso-vida-conceptos-implicaciones-aplicacion-salud-publica. Accessed 2 Jan 2026.

22. Dormido L, Garrido I, L'Hotellerie Fallois P, Santillán Fraile J. El cambio climático y la sostenibilidad del crecimiento: Iniciativas

internacionales y políticas europeas. Documentos ocasionales - Banco de España, ISSN 1696-2222, Nº 13, 2022, págs 1-40. 2022;:1–40.

23. Barchielli B, Cricenti C, Gallè F, Sabella EA, Liguori F, Da Molin G, et al. Climate Changes, Natural Resources Depletion, COVID-19 Pandemic, and Russian-Ukrainian War: What Is the Impact on Habits Change and Mental Health? Int J Environ Res Public Health. 2022;19. https://doi.org/10.3390/IJERPH191911929/S1.

24. Riad A, Drobov A, Krobot M, Antalová N, Alkasaby MA, Peřina A, et al. Mental Health Burden of the Russian-Ukrainian War 2022 (RUW-22): Anxiety and Depression Levels among Young Adults in Central Europe. Int J Environ Res Public Health. 2022;19. https://doi.org/10.3390/IJERPH19148418.

25. Robles JG, Palma PI, Bustingorry SO. Evaluación de las percepciones medioambientales en estudiantes de enseñanza media de la ciudad de Temuco, Región de La Araucanía. Estudios pedagógicos (Valdivia). 2017;43:107–21. https://doi.org/10.4067/S0718-07052017000100007.

26. Armesto A. Preocupación por el cambio climático, condiciones económicas individuales y priorización del medioambiente en América Latina. Opinião Pública. 2021;27:1–27. doi:10.1590/1807-019120212711.

27. Favara JV, Moreno JE, Favara JV, Moreno JE. Preocupación ambiental y conductas proambientales en jóvenes y adultos mayores. Revista de psicología (Santiago). 2020;29:80–9. https://doi.org/10.5354/0719-0581.2020.53184.

28. Cantú-Martínez PC. Preocupación y deterioro de la calidad ambiental. Apreciación de los estudiantes universitarios. Ambient Desarro. 2020;24:1–10. doi:10.11144/JAVERIANA.AYD24-46.PDCA.

29. Ramírez Díaz JL, Gutiérrez Arias R. Educación y conciencia ambiental en estudiantes de dos colegios técnicos nocturnos de la provincia de Cartago, Costa Rica. Innovaciones educativas, ISSN-e 2215-4132, ISSN 1022-9825, Vol 20, Nº 28, 2018 (Ejemplar dedicado a: Educación, lectura y tecnologías en la sociedad contemporánea), págs 53-65. 2018;20:53–65.

30. González López A, Amérigo Cuervo Arango M. La preocupación ambiental como función de valores y creencias. International Journal of Social Psychology, Revista de Psicología Social, ISSN-e 1579-3680, ISSN 0213-4748, Vol 13, Nº 3, 1998, págs 453-461. 1998;13:453–61.

31. Hao F, Song L. Environmental Concern in China: A Multilevel Analysis. Chin Sociol Rev. 2020;52:1–26. https://doi.org/10.1080/21620555.2019.1654367;WGROUP:STRING:PUBLICATION.

32. Clayton S. Climate anxiety: Psychological responses to climate change. J Anxiety Disord. 2020;74. https://doi.org/10.1016/j.janxdis.2020.102263.

33. Corporación Andina de Fomento. Índice de vulnerabilidad y adaptación al cambio climático en la región de América Latina y el Caribe. Corporación Andina de Fomento. 2014;:1–212.

34. Pew Research Center. Global Concern about Climate Change, Broad Support for Limiting Emissions . 2015. https://www.pewresearch.org/global/2015/11/05/global-concern-about-climate-change-broad-support-for-limiting-emissions/. Accessed 2 Jan 2026.

35. Américo Canaza-Choque F. De la educación ambiental al desarrollo sostenible: desafíos y tensiones en los tiempos del cambio climático. Rev Cienc Soc. 2019.

36. Rodrigo Cano D, Gutiérrez Bastida JM. 35 años de éxitos en la Educación Ambiental en España. RES : Revista de Educación Social, ISSN-e 1698-9007, Nº 28, 2019 (Ejemplar dedicado a: Educación Social, medio ambiente y sostenibilidad), págs 32-43. 2019;:32–43.

37. González Gaudiano EJ, Meira Cartea PÁ, González Gaudiano EJ, Meira Cartea PÁ. Educación para el cambio climático: ¿Educar sobre el clima o para el cambio? Perfiles educativos. 2020;42:157–74. https://doi.org/10.22201/IISUE.24486167E.2020.168.59464.

38. Monsour M, Clarke-Rubright E, Lieberman-Cribbin W, Timmins C, Taioli E, Schwartz RM, et al. The impact of climate change on the prevalence of mental illness symptoms. J Affect Disord. 2022;300:430–40. https://doi.org/10.1016/j.jad.2021.12.124.

Declarations

Ethics approval and consent to participate

The study protocol was reviewed and approved by the Ethics Committee of Universidad Privada Antenor Orrego (Approval No. 0417-2022-UPAO). Additional ethics committee or institutional review board approvals in each participating country were not required because this study was anonymous from the outset, with no possibility of identifying respondents, and data were not collected through any specific institution in each country. All participants provided informed consent electronically before completing the survey. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

CRM conceived and designed the study. CVS performed the statistical analysis. All authors contributed to data interpretation, manuscript drafting, and critical revision of the manuscript. All authors read and approved the final manuscript.

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