

Depression in Peruvian university students during the COVID-19 pandemic

Carla Estrada-Ancajima¹

ABSTRACT

Introduction: The COVID-19 pandemic has had a great impact on mental health, being depression one of the most frequent pathologies. Our aim was to determine the prevalence and factors associated with depression in university students during the COVID-19 pandemic. **Methodology:** We conducted an observational, analytical, cross-sectional, prospective study. University students who meet the eligibility criteria were included. The Zung Self-Rating Depression Scale was used to determine levels of depression. The association between variables was evaluated using logistic regression analysis and the chi-square test. **Results:** In total, 261 university students were included; 57.1% (n=149) presented depressive symptoms, of them, 56.4% (n=84) had mild depression, 36.9% (n=55) moderate depression and 6.7% (n=10) severe depression. Depression was more frequent in 18-22 years old students than in the 23-30 years old group (OR: 2.269, 95%CI: 1.352-3.808; p=0.002). Participants who did recreational activities a few times or never had increased odds (OR: 2.293, 95% CI: 1.365-3.851; p=0.002) compared to those who did them. No associations were found regarding sex, socioeconomic status, occupation, housing arrangement, alcohol, and drug consumption. **Conclusions:** The prevalence of depression in university students is high being age and recreational activities associated factors. The impact of COVID-19 on students' mental health should be a major concern and strategies to mitigate it are needed.

Key words: Depression; COVID-19; Risk Factors.

Received: 21-02-2022

Accepted: 16-06-2022

Conflicts of interest: The author did not disclose any possible conflict of interests.

¹ Escuela Profesional de Medicina Humana, Universidad Privada San Juan Bautista, Lima 15067, Perú.

INTRODUCTION

Worldwide, the population is suffering from the lags of the pandemic caused by the Coronavirus Diseases 2019 (COVID-19). According to the epidemiological registry of the World Health Organization, from March 2020 until November 2021, there were 270.031.622 million reported cases and more than 5.301.502 million deaths⁽¹⁾.

Due to the alarming figures, the Peruvian Government implemented restriction measures such as quarantine, isolation and mandatory social distancing that led to the postponement of face-to-face academic activities, promoting education through virtual platforms. Such measures have significantly impacted mental health, regardless of age, gender or social status^(2,3).

Studies have shown that restriction measures contribute to the development and or enhancement of diseases of psychiatric nature such as depression, characterized by mood alterations and, in a more severe way, leading to suicide⁽⁴⁾. In Peru, there are approximately one million 700 thousand cases of people suffering from depression; therefore it is considered a serious health problem⁽⁵⁾. It is estimated that 41% of the population has moderate to severe depressive symptoms, and within this, 12.8% have suicidal ideation⁽⁶⁾. The age group with major depressive involvement was 18-24 years old; most of them were university students⁽⁷⁾.

It is necessary to implement measures to reduce the number of cases of depression; therefore, the objective of this study was to identify the prevalence of depression levels and determine the associated factors in Peruvian university students during the COVID-19 pandemic.

METHODOLOGY

Design and study population

An observational, analytical, cross-sectional and prospective study was carried out. The study population consisted of all those who meet the

eligibility criteria; the inclusion criteria were to be a university student, 18 years old or older, residing in Lima during October and November 2021, to be enrolled in an academic semester and voluntarily accept to participate in the study. Participants who did not answer the survey completely were excluded.

Survey

We used a validated Spanish version of the Zung Self-Rating Depression Scale (SDS)⁽⁸⁾ to assess the level of depression of each participant. Based on the SDS index score, participants were classified as normal (<50), mild depression (50 to 59), moderate depression (60 to 69), and severe depression (>70).

Additionally, an expert judgment validated survey was used to obtain information about demographic and social characteristics. Data collection was obtained through a virtual survey using the Google forms platform.

Statistical analysis

The absolute and relative frequencies were estimated to describe qualitative variables. In the case of quantitative variables, the median and range were estimated after evaluating normality with the Kolmogorov–Smirnov test. The chi-square was used to evaluate associations between levels of depression and demographic and social characteristics. Univariate and multivariate logistic regression was used to assess the association between the evaluated characteristics and the presence of depression.

A p-value <0.05 was considered statistically significant. Statistical analyzes were done using the R Studio software (version 1.3.959; RStudio PBC, Boston, MA, USA).

Ethical aspects

The study was approved by the Institutional Research Ethics Committee of the San Juan Bautista Private University (N ° 890-2021- CIEI-UPSJB). All participants voluntarily gave informed consent to participate. The confidentiality and autonomy of the participants were strictly respected.

Table 1. Sociodemographic characteristics of university students and distribution according to depression levels.

Characteristics	Total n (%)	Normal	Depression n (%)			P
			Mild	Moderate	Severe	
Total n (%)	261 (100.0)	112 (42.9)	84 (32.2)	55 (21.1)	10 (3.8)	
Age						0.014*
18 – 22	124 (47.5)	42 (33.9)	47 (37.9)	32 (25.8)	3 (2.4)	
23 – 30	137 (52.5)	70 (51.1)	37 (27.0)	23 (16.8)	7 (5.1)	
Sex						0.287
Women	142 (54.4)	57 (40.1)	43 (30.3)	35 (24.6)	7 (5.0)	
Men	119 (45.6)	55 (46.1)	41 (34.5)	20 (16.8)	3 (2.5)	
Socioeconomic status						0.693
High and middle	27 (10.3)	13 (48.1)	9 (33.3)	5 (18.5)	0 (0.0)	
Low	234 (89.7)	99 (42.3)	75 (32.1)	50 (21.4)	10 (4.3)	
Occupation						0.927
Student	145 (55.6)	61 (42.1)	49 (33.8)	30 (20.7)	5 (3.4)	
Work and study	116 (44.4)	51 (44.0)	35 (30.2)	25 (21.5)	5 (4.3)	
Housing arrangement						0.336
Living with family	247 (94.6)	106 (43.0)	77 (31.1)	54 (21.9)	10 (4.0)	
Living alone	14 (5.4)	6 (42.9)	7 (50.0)	1 (7.1)	0 (0.0)	
Alcohol consumption						0.762
Yes	130 (49.8)	53 (40.8)	45 (34.6)	28 (21.5)	4 (3.1)	
No	131 (50.2)	59 (45.0)	39 (29.8)	27 (20.6)	6 (4.6)	
Drug consumption						0.345
Yes	13 (5.0)	4 (30.7)	3 (23.1)	5 (38.5)	1 (7.7)	
No	248 (95.0)	108 (43.5)	81 (32.7)	50 (20.2)	9 (3.6)	
Recreational activities						0.015*
Yes	139 (53.3)	71 (51.1)	42 (30.2)	22 (15.8)	4 (2.9)	
Few times	109 (41.7)	39 (35.8)	38 (34.8)	28 (25.7)	4 (3.7)	
No	13 (5.0)	2 (15.4)	4 (30.8)	5 (38.4)	2 (15.4)	

*: <0.05, statistically significant

RESULTS

Participant characteristics

We included a total of 261 participants. The median age was 23 years (Range: 18 - 30), and 54.4% (n = 142) were women.

Regarding sociodemographic characteristics, 89.7% (n = 234) were from a low-socioeconomic status, 44.4% (n = 116) work and study and 94.6% (n = 247) live with their families. A total of 53.3% (n = 139) of participants did recreational activities and 41.7% (n = 109) did them only few times during the pandemic; 49.8% (n = 130) accepted

that they consume alcohol and 5% (n = 13) that they use drogues. (**Table 1**)

Depression and associated factors

It was found that 57.1% (n = 149) of participants had depressive symptoms; of them, 56.4% (n = 84) presented mild depression, 36.9% (n = 55) moderate depression and 6.7% (n = 10) severe depression.

Regarding associated factors, 18-22 years old students presented depression more frequently than the 23-30 years old group (66.1% vs 48.9%) and had a statistically significant increase in the

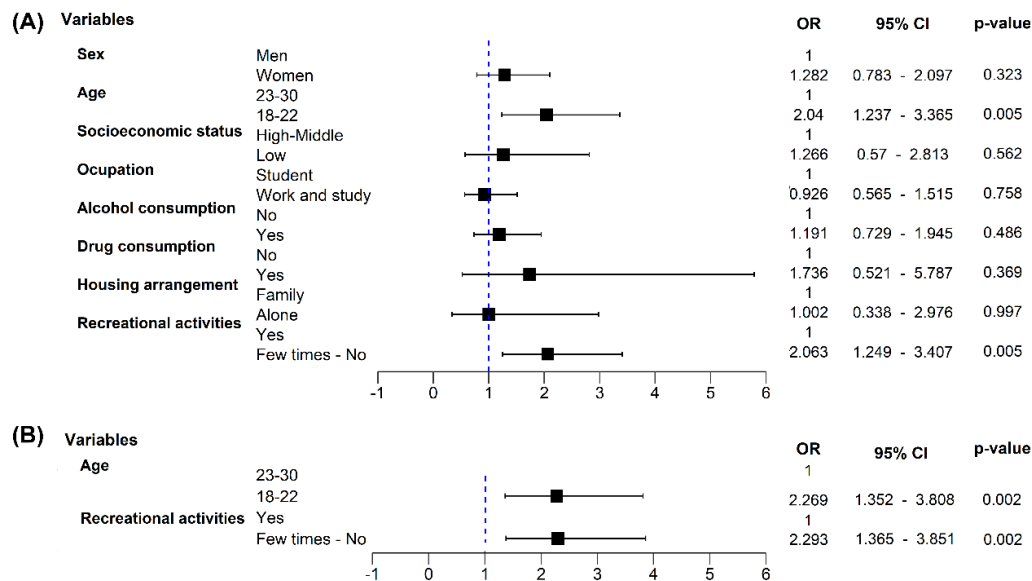


Figure 1. Forest plot of univariate and multivariate logistic regression analysis for factors associated with depression. (A) Univariate analysis, (B) Multivariate analysis. OR: odds ratio; CI: confidence interval.

odds of developing depression [Odds ratio (OR): 2.040, 95% confidence interval (CI): 1.237-3.365; $p=0.005$] (**Figure 1A**). Moreover, age was also associated with levels of depression ($p=0.014$); 25.8% ($n = 32$) of 18-22 years old students had mild depression vs 16.8% ($n = 23$) in the 23-30 group (**Table 1**).

In addition, 48.9% ($n = 68$) of participants who usually did recreational activities presented depression in contrast to 66.4% ($n = 81$) in the group who did them a few times or never (OR: 2.063, 95% CI: 1.249-3.407; $p = 0.005$) (**Figure 1A**). A significant association with the level of depression was also found ($p = 0.015$); 30.2% ($n = 42$) of participants who did recreational activities and 34.8% ($n = 38$) of those who did them a few times had mild depression. In comparison, 38.5% ($n = 5$) of participants who never participated in these activities had moderate depression. (**Table 1**).

In the multivariate analysis, being 23 to 30 years old (OR: 2.269, 95% CI: 1.352-3.808; $p = 0.002$) and doing a few times or not doing recreational activities (OR: 2.293, 95% CI: 1.365-3.851; $p = 0.002$)

remained as significant risk factors (**Figure 1B**).

No association was found between depression and sex, socioeconomic status, occupation, coexistence, alcohol and drug consumption.

DISCUSSION

Researchers agree that university students present high levels of stress, anxiety, and depression. Furthermore, many aspects of university life constitute risk factors⁽⁹⁾. University students' mental health should be a major concern, especially considering the impact of the COVID-19 pandemic. We identified the prevalence of depression and evaluated different characteristics to determine associated factors in university students during the COVID-19 pandemic.

We found that 57.1% of participants presented depression which is significantly higher than before COVID-19; in 2018 a 13.5% prevalence of depression among Peruvian university students was reported⁽¹⁰⁾. During the pandemic, a study that used the Depression, anxiety stress scales-short

form (DASS-21), found that 66.0% of university students in Peru, between 18 to 32 years old, had depression⁽¹¹⁾, while in provinces, a prevalence of 47.0% has been reported⁽¹²⁾. Regarding the levels of depression, mild depression was the most frequent. Our findings are comparable to figures reported in 2020, where according to the Beck Depression Inventory (BDI-2) from students with depression, 65.3% had minimum; 18.4%, slight; 11.2%, moderate; and 5.1%, severe depression⁽¹³⁾. In contrast, a higher frequency of students with severe depression during the COVID-19 pandemic has been reported in the United States⁽¹⁴⁾. The emotional impact of COVID-19 is no different in public or private universities' students⁽¹⁵⁾.

Similar to other studies that point out that participants between the ages of 18 and 25 are more likely to have higher levels of depression^(16,17), in our study population, depression was more frequent in the age group between 18-22 years. This result is consistent with a study that showed that there is an increase in the frequency of major depressive disorders in adolescents (12 to 17 years old) and young adults (18 to 25 years old) but there was no change or a decrease in participants who were 26 years or older⁽¹⁸⁾.

On the other hand, a study reported that Peruvian women are more prone to be worried about the impact of the COVID-19 pandemic on their academic training and, it was hypothesized that this could lead to depression more frequently than in men⁽¹⁹⁾. However, we found that participants presented depression regardless the sex, which coincides with another study that evaluated university students of Lima-Perú⁽¹¹⁾. Other researchers have reported that women present higher scores for depression compared to men, although that studies included more women^(15,20).

Regarding economic factors, the socioeconomic status was not significant in relation to depression; however, other investigations suggest that low socioeconomic status is a risk factor for this psychiatric disorder⁽²¹⁻²³⁾. Probably we could not

find associations since almost 90% of participants had a low socioeconomic level. Besides, the economy in Latin America has been affected by the COVID-19 contingency⁽²⁴⁾, and nowadays is more frequent that students also work. In our cohort, 44.4% of participants worked and study and 56.0% of them presented depression, but no significant association was found. The Government should provide economic and psychological support to these students since working and studying increases the frequency of depression⁽¹⁰⁾.

Despite living in a family environment, participants had some level of depression, but no statistically significant association was found. One author points out that good intra-family relationships and a stable family nucleus are essential to reducing possible mental disorders. However, family interaction was rethought due to the restriction measures, considering this a more critical factor⁽²⁵⁾. Similar studies mention that developing depression is linked to the persistent fear of losing their relatives and, women are the sex with the most significant emotional impact related to the family^(26,27).

Regarding alcohol consumption, no association was found with the level of depression; however, a research study found a significant relationship between these variables ($p=0.004$). It also adds that men are the ones who most frequently perform this activity⁽²⁸⁾. Similarly, the frequency of drugs consumption was low compared to participants in another study, where the authors concluded that depression acts as a mediating variable for the consumption of drugs⁽²⁹⁾. These differences in our results may be due to internal and external factors such as the personality of students, no honest answers, or reduction in the frequency of consumption due to limited access to these substances.

A significant association was found between performing recreational activities and depression. In our study, students who did not perform activities or did them a few times have a major odd of developing depression compared to those

who did them. There is an inverse association between the frequency of entertainment activities and depressive symptoms; for instance, Wathélet M. indicates that the longer the duration of physical activity, the less frequent the depressive symptoms⁽³⁰⁾. The Pan American Health Organization encourages relaxing activities to reduce periods of stress that could lead to mental disorders⁽³¹⁾.

The study has some limitations. Despite we found a significant association between entertainment activities and depression levels, the distribution of participants is unbalanced. To not misestimate the measures of association, the “few times” and “no” groups were combined to assess the association with depression status. Besides, due to the cross-sectional design of the study, we cannot make causal inferences; for instance, the association

between depression and recreational activities works in two ways; not doing these activities could lead to depression but also, depression can cause that people do not engage in these activities⁽³²⁾. In addition, depression was self-reported, and this study provides only an estimate of the real burden of this disease.

In conclusion, during the COVID-19 pandemic, most university students in Lima present depressive symptoms, regardless of sex, socioeconomic status, working in addition to studying, living with family, and consuming alcohol and drugs. Governments and universities must develop intervention strategies that allow students to assertively face situations that are considered a threat to safeguard mental health. Recreational activities that do not expose students to COVID-19 should be encouraged.

REFERENCES

1. World Health Organization. WHO Coronavirus (COVID-19) Dashboard. WHO Coronavirus (COVID-19) Dashboard With Vaccination Data [Internet]. WHO. 2021 [cited 2021 Dec 17]. p. 1–5. Available from: <https://covid19.who.int/>
2. Chicchón J. Factores asociados a la ansiedad y depresión hospitalaria en pacientes ingresados al servicio de medicina interna del Centro Médico Naval “Cirujano Mayor Santiago Távara” Octubre - Diciembre 2017. Universidad Ricardo Palma. Univ Ricardo Palma [Internet]. 2017;1–147. Available from: http://repositorio.urp.edu.pe/bitstream/handle/urp/989/SP_VALDEZ_AB.pdf?sequence=3&isAllowed=y
3. Obregón B, Montalván J, Segama E, Dámaso B, Panduro V, Arteaga K. Factores asociados a la depresión en estudiantes de medicina de una universidad peruana. *Educ Med Super*. 2020;34(2): e1881.
4. Taboada Villarreyes VF. Factores asociados al consumo de sustancias psicoactivas en estudiantes de medicina de la Universidad Nacional de Piura, en el contexto de la pandemia por COVID-19, durante el primer semestre del 2021. 2021;57. Available from: http://repositorio.uch.edu.pe/xmlui/handle/uch/112%0Ahttp://repositorio.uladech.edu.pe/bitstream/handle/123456789/13540/COMUNICACION_FAMILIAR_FAMILIA_FLORES_BENAVENTE_TANIA_NOELIA.pdf?sequence=1&isAllowed=y%0Ahttp://repositorio.uladech.edu.pe/bitstream/ha
5. Instituto Nacional de Salud Mental Honorio Delgado - Hideyo Noguchi” [Internet]. [cited 2021 Aug 2]. Available from: <https://www.insm.gob.pe/oficinas/comunicaciones/notasdeprensa/2016/031.html>
6. Ministerio de Salud Perú. Plan de Salud Mental 2016-2020. Minsa [Internet]. 2020;2021:60. Available from: <http://bvs.minsa.gob.pe/local/MINSA/5092.pdf>
7. Sánchez Carlessi HH, Yarlequé Chocas LA, Alva LJ, Nuñez LLacuachaqui ER, Arenas Iparraguirre C, Matalinares Calvet ML, et al. Anxiety, depression, somatization and experiential avoidance indicators in peruvian university students in quarantine by COVID-19. *Rev la Fac Med Humana*. 2021;21(2):346–53.
8. Nina Bonifacio, E. Niveles de ansiedad y depresión en pacientes que acuden a la consulta de emergencia

- del Hospital Hipólito Unanue de Tacna, mayo a junio del 2019. 2019;103. Available from: <http://repositorio.unjbg.edu.pe/handle/UNJBG/3838>
9. Mofatteh M. Risk factors associated with stress, anxiety, and depression among university undergraduate students. *AIMS Public Heal.* 2021;8(1):36–65.
 10. Vargas M, Talledo-Ulfe L, Heredia P, Quispe-Colquepisco S, Mejía CR. Influence of Habits on Depression in the Peruvian Medical Student: Study in Seven Administrative Regions. *Rev Colomb Psiquiatr.* 2018;47(1):56–64.
 11. Soto Rodríguez I, Zuñiga Blanco A. Depresión, ansiedad y estrés de universitarios en tiempos de COVID-19: Uso de escala DASS-21. *Espíritu Emprend TES.* 2021;5(3):45–61.
 12. Gonzales Neyra, JR. Nivel De Depresión, Ansiedad Y Estrés En Jóvenes Universitarios Asociado A Confinamiento Social – Arequipa 2020. Repos Tesis Univ Católica St María [Internet]. 2020;107. Available from: <https://core.ac.uk/download/pdf/304704675.pdf>
 13. Parra MR. Depression and the meaning of life in university students in times of pandemic. *Int J Educ Psychol.* 2020;9(3):223–42.
 14. Rudenstine S, McNeal K, Schulder T, Ettman CK, Hernandez M, Gvozdieva K, et al. Depression and Anxiety During the COVID-19 Pandemic in an Urban, Low-Income Public University Sample. *J Trauma Stress.* 2021;34(1):12–22.
 15. Rodríguez de los Ríos LA, Carbajal Llanos YM, Narvaez Aranibar T, Gutiérrez Vásquez RJ. Impacto emocional por COVID-19 en estudiantes universitarios. Un estudio comparativo. *Rev Educ UMCH.* 2020;1(16):14.
 16. Ozamiz-Etxebarria N, Dosil-Santamaria M, Picaza-Gorrochategui M, Idoiaga-Mondragon N. Stress, anxiety, and depression levels in the initial stage of the COVID-19 outbreak in a population sample in the northern Spain. *Cad Saude Publica.* 2020;36(4):1–10.
 17. Ustun G. Determining depression and related factors in a society affected by COVID-19 pandemic. *Int J Soc Psychiatry.* 2021 Feb;67(1):54-63
 18. Twenge JM, Cooper AB, Joiner TE, Duffy ME, Binau SG. Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005-2017. *J Abnorm Psychol [Internet].* 2019 Apr 1 [cited 2021 Dec 22];128(3):185–99. Available from: <https://pubmed.ncbi.nlm.nih.gov/30869927/>
 19. Serna-Alarcón V, Paraguay KM, Mejía AS, Rodríguez-Alarcón JF, Vinelli-Arzuviaga D, Vilela-Estrada MA, et al. Percepción de los estudiantes universitarios peruanos acerca de las repercusiones académicas generadas por la COVID-19. *Boletín Malariol y Salud Ambient.* 2021;61(ee2):163–9.
 20. Vivanco-Vidal A, Saroli-Aranibar D, Caycho-Rodríguez T, Carbajal-León C, Noé-Grijalva M. Ansiedad por Covid - 19 y salud mental en estudiantes universitarios. *Rev Investig en Psicol.* 2020;23(2):197–215.
 21. Ramírez-Ortiz J, Castro-Quintero D, Lerma-Córdoba C, Yela-Ceballos F, Escobar-Córdoba F. Consecuencias De La Pandemia Covid 19 En La Salud Mental Asociadas Al Aislamiento Social. *Revista Colombiana de Anestesiología.* 2020;48(4) e930.
 22. Hernández Rodríguez J. Impacto de la COVID-19 sobre la salud mental de las personas. *Medicentro Electrónica.* 2020;24(3):578–94.
 23. Chau C, Vilela P. Determinantes de la Salud mental en Estudiantes. *Rev Psicol.* 2017;35(2):387–422.
 24. Crecimiento de América Latina y el Caribe en 2021 no alcanzará a revertir los efectos adversos de la pandemia | Comunicado de prensa | Comisión Económica para América Latina y el Caribe [Internet]. [cited 2021 Sep 5]. Available from: <https://www.cepal.org/es/comunicados/crecimiento-america-latina-caribe-2021-alcanzara-revertir-efectos-adversos-la-pandemia>
 25. Apaza P. CM, Seminario Sanz RS, Santa-Cruz Arévalo JE. Factores psicosociales durante el confinamiento por el covid-19 – Perú. *Rev Venez Gerenc.* 2020;25(90):402–13.
 26. Yusvisaret L, Palmer S, Medina C, López D. Prevalencia de depresión durante la COVID-19 en estudiantes de medicina de una universidad privada mexicana. *Medisan* 2021;25(3):1–10.
 27. Giraldo Giraldo VA. Efectos del confinamiento en estudiantes universitarios: un análisis basado en diferencias de género. *CIID Journal.* 2021;1(1):507–16.
 28. Estrada Durand, P. Consumo De Alcohol Como

- Factor Asociado a La Depresión En Estudiantes Varones De Medicina Humana De La Universidad Ricardo Palma Del Año 2018. *Rev la Fac Med Humana*. 2019;19(1):1–5.
29. Restrepo JE, Amador Sánchez O, Calderon Vallejo G, Castañeda Quirama T, Osorio Sánchez Y, Diez Cardona P. Depresión y su relación con el consumo de sustancias psicoactivas, el estrés académico y la ideación suicida en estudiantes universitarios colombianos. *Heal Addict y Drog*. 2018;18(2):227–39.
30. Wathelet M, Duhem S, Vaiva G, Baubet T, Habran E, Veerapa E, et al. Factors Associated With Mental Health Disorders Among University Students in France Confined During the COVID-19 Pandemic. *JAMA Netw open*. 2020;3(10):e2025591.
31. Organización Munidal de la Salud, Organización Panamericana de la Salud. Consideraciones psicosociales y de salud mental durante el brote de COVID-19. 2020. 2020;2019:1–7. Available from: <https://www.paho.org/sites/default/files/2020-03/smmaps-coronavirus-es-final-17-mar-20.pdf>
32. Kennedy SH. Core symptoms of major depressive disorder: relevance to diagnosis and tratment. *Dialogues Clin Neurosci*. 2008;10(3):271-7.

Correspondence:

Carla Estrada-Ancajima

Ex Hacienda Villa, Av. José Antonio Lavalle s/n, Chorrillos 15067, Lima, Perú.

Phone: +51 (01) 2545302

E-mail: carla.estrada@upsjb.edu.pe