ORIGINAL ARTICLE

FACTORS ASSOCIATED WITH FAILURE IN THE SCORES OF THE NATIONAL DENTISTRY EXAM IN PERU, 2017-2021

Factores asociados al fracaso en los puntajes del Examen Nacional de Odontología en Perú, 2017-2021

Bryan Alexis Cossio-Alva,[1] Ibraín Enrique Corrales-Reyes,[2] Christian R. Mejia.[3,4]

1. Universidad César Vallejo. Facultad de Ciencias de la Salud. Escuela de Estomatología, Piura, Peru.
2. Manatee Oral and Facial Surgery Center, Bradenton, FL, United States.
3. Asociación Médica de Investigación y Servicios en Salud, Lima, Peru.
4. Universidad Continental, Huancayo, Peru.

ABSTRACT

Introduction: In Peru, there is little research on academic performance of dentistry students in the exit exam. **Objective:** To determine the factors associated with failure in the scores of the National Dentistry Exam (Examen Nacional de Odontología - ENAO) among applicants to the Peruvian Rural and Urban Marginal Health Service (Servicio Rural y Urbano Marginal de Salud - SERUMS) during 2017-2021.

Materials and Methods: This is an observational, analytical, and cross-sectional study. The dependent variable was the failing score (score < 10.5 points). Descriptive statistics were calculated and associated factors were obtained using generalised linear models.

Results: Among the 7275 examinees, the average failure rate was 31% and graduates from private universities were the ones who obtained failing scores the most. The factors associated with failing the ENAO were the nationality of the applicants (Peruvians failed the most, p=0.032), sex (women failed the most, p<0.001), the type of university (applicants from private universities failed the most, p<0.001), whether the university of graduation was located in Lima (applicants from provinces failed the most, p=0.014), the region where the university was located (applicants from the highlands failed the most, p<0.001) and the year of application (2021 had the most number of failing scores, p<0.001).

Conclusion: Three out of ten applicants have a failing score in the ENAO and there are associated factors. This opens discussion about whether universities are training future dentistry professionals well from the theoretical point of view, whether this score must be used for them to practice their career or not, and what actions must be taken to improve the situation.

Keywords: Exam questions; Students, dental; Academic Performance; Dentists; Universities; Peru.

RESUMEN

Introducción: En el Perú son escasas las investigaciones que abordan el desempeño académico de los odontólogos en el examen de egreso. **Objetivo:** Determinar los factores asociados al fracaso en los puntajes del Examen Nacional de Odontología (ENAO) entre los postulantes al Servicio Rural y Urbano Marginal de Salud peruano (SERUMS) 2017-2021.

Materiales y métodos: Estudio observacional, analítico y transversal. La variable dependiente fue el tener una nota de suspenso (nota < 10.5 puntos). Se calcularon estadísticos descriptivos y se obtuvieron los factores asociados mediante modelos lineales generalizados.

Resultado: En los 7275 examinados, el promedio de suspendidos fue del 31% y los egresados de universidades privadas fueron los que más desaprobaron. Los factores asociados al haber suspendido el ENAO fueron la nacionalidad de los postulantes (los peruanos suspendían más p=0,032), el sexo (las mujeres suspendían más p<0,001), el tipo de universidad (los de universidades privadas suspendían más p<0,001), si la universidad de egreso se ubicaba en Lima (los de provincia suspendían más p=0,014), la región donde se ubicaba la universidad (los de la sierra suspendían más p<0,001) y el año de la postulación (el 2021 hubo más suspendidos p<0,001).

Conclusión: Tres de cada diez postulantes tienen una nota desaprobatoria en el ENAO y existen factores asociados. Ello abre el debate acerca de si las universidades están formando bien a los futuros odontólogos desde el punto de vista teórico, si es que esta nota deberá servir para que ejerzan o no y qué acciones se deben tomar para mejorar la situación.

Palabras Clave: Preguntas de examen; Estudiantes de odontología; Rendimiento Académico; Odontólogos; Universidades; Perú.

INTRODUCTION

Higher education plays a fundamental role in the development of nations.[1] The accreditation model of educational quality demands comprehensive training, competent professional performance, and continuous improvement[2] due to the rapid development of science and technology.[3] All this training aims to meet the health demands of the population and achieve better health services.[4] However, not all the results are favourable all the time; for example, in Peru, four out of ten Peruvian medical students failed their exit exam.[5]

In Dentistry, multiple evaluations have been found at international level which attempt to measure how dentistry students graduate, especially in the countries of Chile,[6] Colombia,[7] Cuba,[8] Mexico,[9] and Canada.[10]

In Peru, the National Dentistry Exam (ENAO) was made official in 2016[11] and the Association of Dental Schools (Asociación Peruana de Facultades de Odontología - ASPEFO) was responsible for its development, through experts from selected Dental Schools of the country's member universities.This exam consists of 200 multiple-choice questions and assesses basic knowledge (20%), clinical cases (60%), public health (10%), research (5%), health services management (3%), ethics and deontology (2%).[12] The participants are provided with a list of the topics included in the evaluation. Passing this exam is a mandatory requirement to participate in the Peruvian Rural and Urban Marginal Health Service (SERUMS),[13] which will serve to find state job positions, scholarships,[14,15] and to apply for a specialization.[16]

With regard to academic performance in the field of Dentistry, multiple research have addressed the associated factors. For example, in Chile, Misrachi-Launert *et al.,*[17] evaluated the influence of different sources of stress on the academic performance of 302 students and found that workload was negatively correlated with academic performance, while pre-clinical and clinical practice showed a positive correlation. Another Chilean study[18] determined that the female gender, university selection test scores and not having a history of failure were factors associated with academic success in 119 dental students during the clinical cycle of their professional training.

In Colombia, other factors associated with the academic performance of students were found, for example: economic resources, non-attendance of patients at their clinics, lack of theoretical knowledge,[19] health-related quality of life,[20] emotional disorders,[21] internet addiction,[22] as well as family functionality and friend support.[23] A Mexican research[24] linked quality of life and healthy habits to academic performance, while another research[25] showed that students who work in jobs related to their careers have better academic grade averages.

The foundation of this study is that the current trends in university education require higher education institutions to design strategies and processes aimed at increasing the quality of training, improving student learning and reducing failure to achieve satisfactory utilization and terminal efficiency indices. The study of the factors that are related to academic performance provides a frame of reference for the design of educational policies that allow increasing the quality of university education, while providing information to the main educational agents regarding the knowledge considered necessary. to enter the workforce.[4]

In spite of the existence of this background, it is important to continue generating evidence, since there may be other factors that are associated with academic performance. Hence, the objective of this study was to determine the factors associated with failing in the scores of the ENAO among applicants to SERUMS during 2017-2021.

MATERIALS AND METHODS

Study design

This is an observational, analytical, and cross-sectional study. The study sample comprised 7277 applicant dentistry professionals. The ENAO is a theoretical evaluation that offers access to the Rural and Urban Marginal Health Service (SERUMS).

To take the exam, the professional must register voluntarily; it is not mandatory. Additionally, not all those who take the exam register for the SERUMS job placement process.

Therefore, in the present research, only the grades of the professionals who were awarded a job position were evaluated, as they are the ones who provided health services and have implications in the population.

Sample and data collection

Notes from the ENAO of national and international professionals who were awarded a working position in SERUMS, and who were correctly registered according to the variables to be studied, were included.

The sample included universities with schools of Dentistry and their graduates. The scores of two professionals were excluded due to inadequate data records. Thus, the final sample comprised 7275 dentistry professionals enrolled in the SERUMS processes during 2017-2021. The data were obtained through the System of Attention of Requests for Access to Public Information via the website of the Ministry of Health (SAIP-MINSA) (https://www.minsa.gob.pe/portada/transparencia/solicitud/frmFormulario.asp).

The information was verified, and the data of these two records were excluded through the data quality control process. Subsequently, all the information was exported to Microsoft Excel (Windows 2019).

Variables

The dependent variable was the failing score in the ENAO (score < 10.5 points), which is the cut-off point used in the Peruvian educational system, employing a vigesimal scale (0-20 points).

The independent variables included the nationality of the applicant (Peru or other countries), the university, the type of university according to its funding (public, private, or foreign), the country of the university from which the applicant graduated, the region where the university is located (highlands, coast, jungle region, or abroad), whether the university is located in Lima (yes or no), and the year of application to SERUMS.

Ethical considerations

The research was approved by the Ethics Institutional Committee of Universidad Norbert Wiener (Registration No. 2022-2022). The information about the dentistry applicants' scores in the ENAO was used exclusively for research purposes, safeguarding the applicants' identities and ensuring confidentiality at all times, which is a fundamental principle of ethical research. Additionally, all the data were publicly available.

Data analysis

For data analysis, the dependent variable was first obtained and then analyzed through cross-tabulation for each secondary variable. Due to the large number of universities, only the ten universities with the best and worst score percentages were reported. Following this, the failing score percentages were reported according to the countries with the highest number of applicants. Subsequently, analytical statistics were estimated, and p-values were obtained using the chi-square test (X^2).

Finally, crude prevalence ratios, 95% confidence intervals, and p-values were obtained through generalized linear models with Poisson family, log-link function, and models for robust and adjusted variances according to the university from which the applicants graduated. A 0.05 cut-off point was considered for statistical significance. Considering that the universities analyzed had different sample sizes, this variable was used as a cluster or adjustment to account for the diversity of characteristics according to population groups.

Throughout this process, the statistical software Stata version 11.1 (StataCorp LP, College Station, TX, USA) was used.

RESULTS

Of the 7275 records of the period 2017-2021, the best percentages of graduates with passing scores were obtained by Universidad Nacional Mayor de San Marcos (0.0% failed), Universidad Nacional de Trujillo (0.9% failed) and Universidad Nacional del Altiplano (2.4% failed).

In contrast, the three universities with the most applicants with failing scores were Universidad Peruana del Oriente (63.6% failed), Universidad Cesar Vallejo (53.4% failed) and Universidad Tecnológica de Los Andes (52.5% failed). (Table 1)
The overall average of graduates with failing scores was 31% (2224 out of 7275 failed) this is, out of the total of analysed scores. According to the country of the university, Peru had the same number of graduates with failing scores (2204 out of 7212 failed). The applicants who graduated from universities in Bolivia and Venezuela had 35% (11 out of 31 failed) and 27% (4 out of 15 failed) failing scores, respectively. (Figure 1)

Figure 2 shows the average of the grades from year to year, where it can be seen that the grades of the odd years were lower on average than those of the even years. There were also some extreme grades, especially in some cases that reached zero. Another important point is to see that the grades were better in the first years, dropping progressively as the years went by. The factors associated with failing the ENAO were the nationality of the applicants (Peruvians failed the most, $p=0.032$), sex (women failed the most, $p<0.001$), the type of university (applicants from private universities failed the most, $p<0.001$), whether the university of graduation was located in Lima (applicants from provinces failed the most, $p=0.014$), the region where the university was located (applicants from the highlands failed the most, $p<0.001$) and the year of application
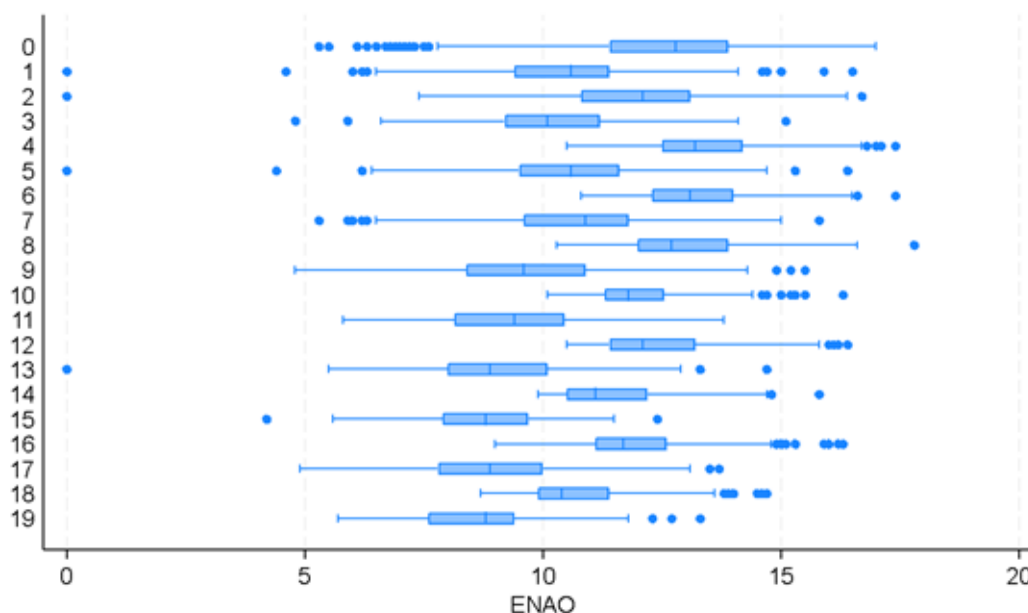
Figure 1.

Percentage of applicants who failed the ENAO according to the home country of the university.
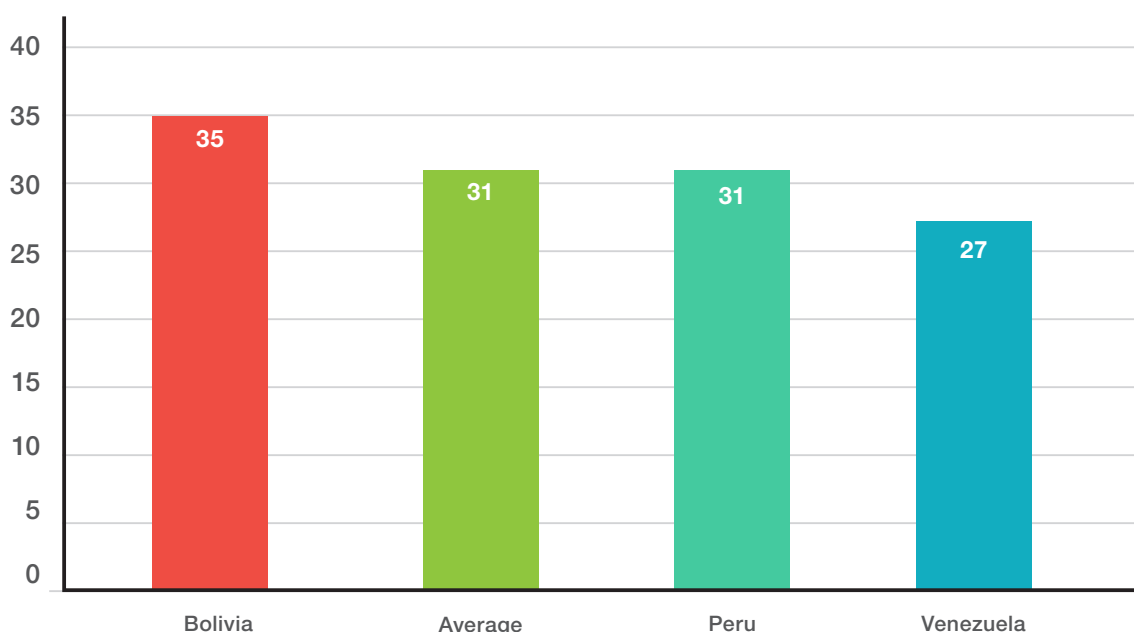
Note: Only countries with more than 10 records were considered.

Figure 2.

Box-and-whisker plot of ENAO scores according to the year evaluated.

Note: Axis x the ENAO score and axis y the year of the exam.

Table 1.

Top ten universities with best and worst percentages of passing scores among their SERUMS applicants 2017-2021, according to ENAO results.

University	City	Type	Fail (%)
Universities with best pass percentage n/total (%)			
U. N. Mayor de San Marcos	Lima	Public	0/230 (0.0)
U. N. de Trujillo	Trujillo	Public	1/113 (0.9)
U. N. del Altiplano	Puno	Public	5/210 (2.4)
U. Católica Santo Toribio de Mogrovejo	Chiclayo	Private	2/79 (2.5)
U. N. de San Antonio Abad de Cusco	Cusco	Public	4/106 (3.8)
U. N. Jorge Basadre Grohmann	Tacna	Public	4/90 (4.4)
U. Peruana Cayetano Heredia	Lima	Private	8/171 (4.7)
U. N. Hermilio Valdizán	Huánuco	Public	12/132 (9.1)
U. Peruana de Ciencias Aplicadas	Lima	Private	13/102 (12.8)
U. N. Toribio Rodríguez de Amazonas	Chachapoyas	Public	10/74 (13.5)
Universidad Peruana del Oriente	Iquitos	Private	28/44 (63.6)
Universidad César Vallejo	Piura	Private	70/131 (53.4)
Universidad Tecnológica de Los Andes	Abancay	Private	62/118 (52.5)
Universidad Católica Los Ángeles de Chimbote	Chimbote	Private	167/320 (52.2)
Universidad Andina Néstor Cáceres Velásquez	Juliaca	Private	166/321 (51.7)
Universidad Peruana Los Andes	Huancayo	Private	111/223 (49.8)
Universidad Científica del Perú	Iquitos	Private	18/41 (43.9)
Universidad Señor de Sipán	Chiclayo	Private	68/155 (43.9)
Universidad Norbert Wiener	Lima	Private	48/113 (42.5)
Universidad Alas Peruanas	Lima	Private	432/1039 (41.6)

U.N.: Universidad Nacional (National University). We did not consider universities with less than 30 records.

Table 2.

Factors associated with having failed the ENAO according to applicants to SERUMS 2017-2021.

Variables		Failed n (%)		p-value
		No	Yes	
Applicant nationality	Other countries	2024 (70.9)	832 (29.1)	0.032
	Peru	3027 (68.5)	1392 (31.5)	
Sex	Male	1839 (72.5)	699 (27.5)	<0.001
	Female	3212 (67.8)	1525 (32.2)	
Country of university from which applicants graduated University type	Other countries	43 (68.3)	40 (31.7)	0.839
	Peru	5008 (69.4)	2204 (30.6)	
	Public	1385 (86.1)	224 (13.9)	<0.001
	Private	3623 (64.7)	1980 (35.3)	
	Foreign	43 (68.3)	20 (31.7)	
University is in Lima*	No	2522 (68.1)	1179 (31.9)	0.014
	Yes	2486 (70.8)	1025 (29.2)	
Region where the university is located	Highlands	975 (65.2)	510 (34.8)	<0.001
	Coast	3709 (70.1)	1586 (29.9)	
	Jungle	342 (76.0)	108 (24.0)	
	Abroad	43 (68.2)	20 (31.8)	
Year of application to SERUMS	2017	1082 (66.0)	558 (34.0)	<0.001
	2018	1369 (78.5)	375 (21.5)	
	2019	1047 (68.1)	490 (31.9)	
	2020	849 (68.5)	391 (31.5)	
	2021	704 (63.2)	410 (36.8)	

*: Graduates from universities abroad were not considered.

Table 3.

Bivariate analysis of factors associated with having a failing score in the ENAO among the applicants to SERUMS 2017-2021.

Variables		Prevalence ratio	95% CI	p-value
Peruvians (applicant nationality)		1.08	0.96-1.21	0.188
Female sex		1.17	1.09-1.29	0.002
Graduates from a Peruvian university		0.96	0.68-1.36	0.830
University is in Lima*		0.92	0.59-1.40	0.689
Region where the university is located	Highlands	Reference	Reference	Reference
	Coast	0.86	0.54-1.38	0.535
	Jungle	0.69	0.35-1.34	0.276
	Abroad	0.91	0.56-1.49	0.714
Year of application to SERUMS	2017	Reference	Reference	Reference
	2018	0.63	0.51-0.78	<0.001
	2019	0.94	0.78-1.12	0.478
	2020	0.93	0.74-1.16	0.498
	2021	1.08	0.92-1.27	0.341

Statistics were obtained with generalised linear models, with Poisson family, log-link function, models for robust and adjusted variances according to university from which applicants graduated. *Graduates from universities abroad were not considered.

(2021 had the most number of failing scores, $p<0.001$). (Table 2)

When conducting the analysis to obtain the prevalence ratio, we found that the only significant variables were sex (crude prevalence ratio: 1.17; 95% confidence interval: 1.09-1.29; p-value=0,002) and the year of application to SERUMS, and we could observe that there were fewer applicants with failing scores during 2018 than in the reference year (crude prevalence ratio: 0.63; 95% confidence interval: 0.51-0.78; p-value<0.001), (Table 3).

When performing the multivariate analysis with the two variables that had significant results in the previous step, it was found that the women failed the most (aPR: 1.17; 95% CI: 1.05-1.29; p-value=0.003) and that the applicants to the SERUMS 2018 process failed less (aPR: 0.63; 95% CI: 0.51-0.78; p-value <0.001).

DISCUSSION

Evaluations allow us to measure students' progress and prepare them for continuing education. They are the most accurate way to estimate the quality of the teaching-learning process.[26,27] However, there are still many detractors of the results of the ENAO and other similar exams, as they only measure knowledge through a written exam, while in other contexts, practical application is also evaluated.

Despite this, the ENAO remains the most homogeneous way to evaluate the training that graduates have received, at least until a more comprehensive evaluation can be structured.[9,28] In this study, it was found that three out of ten dentistry graduates applying to SERUMS have a failing score. Additionally, half of the universities with unfavorable average scores were not licensed by the National Superintendence of Higher Education (SUNEDU).

Similar results were reported regarding medical graduates,[16] which underscores the importance of university centers demonstrating that they have the basic quality services to provide students with the best learning strategies.[29]

Graduates from private universities had the highest failure rates. This has also been reported among medical students,[5] despite the general perception that these institutions offer better strategies for national exams.[30-33] Some private universities have neglected quality education for many years, being labeled as education mercenaries or being perceived as issuing professional titles in exchange for money.[34]

While one out of every three students in private universities fails, one out of every six students in public universities does. This disparity should be considered during the ratification of licensing in the coming years. Applicants from provinces, predominantly from universities in the Peruvian highlands, were the ones who failed the most. On the other hand, Mendoza-Chuctaya et al.,[5] found that medical graduates from the Andes had lower failing percentages compared to other regions.

Currently, there are no studies demonstrating the variability of teaching between geographic regions and the factors associated with these differences in dental training. This gap calls for more research to understand the perceptions of students in each region and objective evaluations of scores and other relevant factors.

Regarding international comparisons, Bolivia had the most students with failing scores. This raises questions about whether the requirements for recognizing foreign professional degrees meet the quality standards for professional practice in Peru. Moreno-Loaiza et al.,[31] found a poor correlation between graduates' weighted averages and scores obtained by foreigners in the national medical exam. This issue persists as graduates from countries like Cuba, Bolivia, and Venezuela

often arrive with high weighted averages but obtain low scores on the national exam.

In this research, female sex was associated with failing grades. However, literature on this topic shows divergent results. For instance, a Peruvian study evaluating graduates of Universidad César Vallejo during 2017-2019 found that gender was not associated with scores in the National Dentistry Exam.[35] In contrast, research with Chilean dentistry students[18] reported that gender was associated with academic success, with women achieving higher approval ratings. The relationship between gender and academic performance remains a topic of debate in medical education.

Changes in educational methodologies and high levels of depression, anxiety, and stress during the pandemic may have influenced these scores.[32] Additionally, electronic methods in education were more favorably adapted in developed countries.[33] This shift to a virtual modality warrants further study to under-stand its impact on exam performance.

This study found that female gender was associated with a higher probability of obtaining failing grades on the ENAO. However, previous research has shown divergent results. A Peruvian study of graduates did not find gender to be a factor associated with grades obtained on the ENAO.[35]

On the other hand, research with dental students in Chile reported that gender was associated with academic success, with women achieving higher pass rates.[6] These differences underscore the need to further study the relationship between gender and academic achievement in dental education, considering contextual and methodological factors to better explain these disparities. It is important to note that parti-cipation in the ENAO is not mandatory for all professionals. Only those interested in accessing SERUMS must take this exam. Therefore, the sample of 7275 dental professionals who took the ENAO during 2017-2021 reflects a specific part of the population of dentists, those seeking to participate in SERUMS, and not necessarily all dental graduates in the country.

There were also variations according to the year of application, with 2021 showing the highest number of failing scores. The COVID-19 pandemic necessitated a shift to a virtual exam format, which could explain this result.

The main limitation of this research is that we analyzed the scores of participants in the SERUMS processes and not all those who took the ENAO, as this information is not public. Participants may take the exam multiple times, with the data representing the score of the latest attempt.

Further research should aim to use direct scores and additional variables to generate more associations. Despite these limitations, the results provide an initial situational analysis, serving as a baseline for future hypotheses in Peru and other countries with similar exams.

CONCLUSION

Three out of every ten dentistry graduates in Peru who apply to SERUMS fail the National Dentistry Exam and graduates from private universities fail to a greater extent. The factors associated with failing the ENAO were the nationality of the applicants, the type of university, whether the university of graduation was located in Lima, the region where the university was located, and the year of application.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interests.

ETHICS APPROVAL

The research was approved by the Institutional Ethics Committee of Norbert Wiener University. (Exp. N°2022-2022).

AUTHORS' CONTRIBUTIONS

Bryan Cossio-Alva: Conceptualization, data curation, funding acquisition, investigation, methodology, project administration, resources, validation, writing – original draft, writing – review and editing.

Ibraín Corrales-Reyes: Conceptualization, data curation, funding acquisition, investigation, methodology, project administration, resources, supervision, validation, writing – original draft, writing – review and editing.

Christian Mejia: Data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, supervision, validation, visualization, writing – original draft, writing – review and editing.

ORCID

Bryan Cossio-Alva
ⓘD 0000-0003-1568-5324
Ibraín Corrales-Reyes
ⓘD 0000-0002-2146-9014
Christian Mejia
ⓘD 0000-0002-5940-7281

PUBLISHER'S NOTE

All statements expressed in this article are those of the authors alone and do not necessarily represent those of the publisher, editors, and reviewers.

PEER REVIEW

This manuscript was evaluated by the editors of the journal and reviewed by at least two peers in a double-blind process.

PLAGIARISM SOFTWARE

This manuscript was analyzed Compilatio plagiarism detector software. Analysis report of document ID. f21f4984a7454a048136e996b e2d745e1482ef2e

REFERENCES

1. Soledad V. Tendencias en el campo de la educación superior y su incidencia en el Trabajo Docente Universitario. Rev Educ Sup. 2020;49(193):107-27.

2. Sistema Nacional de Evaluación, Acreditación y Certificación de la Calidad Educativa. Modelo de acreditación institucional para universidades. Lima. Sineace. 2017.

3. Ji YA, Kho HS, Kwon HB, Kim YJ, Seol YJ, Huh KH, Kim RJ, Yoon HI, Baek SH. Developing a clinical presentation dental education model and a pilot test. Eur J Dent Educ. 2021 Feb;25(1):78-85. doi: 10.1111/eje.12578. Epub 2020 Sep 19. PMID: 32777126.

4. Fuentes J, Silva M, Llermaly S. Examen Nacional de Odontología. Revisión bibliográfica de instrumentos. Int J Odontostomat. 2014;8(1):125-31. http://dx.doi.org/10.4067/S0718-381X2014000100017

5. Mendoza-Chuctaya G, Calla-Torres MR, Ramos KR, Mejia CR. Examen Nacional de Medicina (ENAM): Análisis de la última década de evaluaciones teóricas en los futuros médicos del Perú. Acta Med Peru. 2021;38(3):169-76. http://dx.doi.org/10.35663/amp.2021.383.2164

6. Fuentes R, Gamonal J. Examen Nacional de Odontología en Chile. Int J Interdiscip Dent. 2021;14(3):217. http://dx.doi.org/10.4067/S2452-55882021000300217

7. Álvarez MC, Plata LD, Vargas AJ, Fajardo EJ. Educación superior en Santander, Colombia: determinantes del rendimiento académico de los estudiantes en las pruebas Saber Pro 2018. Rev Gestión Desarrollo Libre. 2019;4(8):131-59. https://revistas.unilibre.edu.co/index.php/gestion_libre/article/view/8124/7290

8. Gutiérrez ST, López EE, Legañoa J, Marrero A. Caracterización del examen estatal escrito de Estomatología de la Universidad Médica de Camagüey. Rev Hum Med. 2013;13(3):843-64. http://www.humanidadesmedicas.sld.cu/index.php/hm/article/download/330/267

9. Cutipa M, Chávez V, Carrasco M. Rendimiento académico y evaluación de egreso en un programa de Estomatología. Rev Estomatol Hered. 2021;31(4):256-63. https://doi.org/10.20453/reh.v31i4.4093

10. Espinoza-Vázquez O, Martínez-González A, Sánchez-Mendiola M, Leenen I. Análisis de un examen clínico objetivo estructurado en Odontología desde la teoría de la generalizabilidad. Inv Ed Med. 2017;6(22):109-18. https://doi.org/10.1016/j.riem.2016.09.001

11. Ministerio de Salud de Perú. Resolución Ministerial N°339-2016/MINSA: Oficializar el Examen Nacional de Odontología-ENAO, 2016.

12. Asociación Peruana de Facultades de Odontología. Reglamento del Examen Nacional de Odontología. ENAO.

13. Ministerio de Salud. Instructivo proceso SERUMS 2021-II.

14. Llanos-Najarro E, Villafuerte-Cooban D, Moquillaza-Alcántara V. Características universitarias asociadas a la adjudicación de plazas para obstetras en el servicio rural peruano. Rev Fac Med Hum. 2020;20(2):240-45. https://doi.org/10.25176/RFMH.v20i2.2897

15. Mayta-Tristán P, Poterico JA, Galán-Rodas E, Raa-Ortiz D. El requisito obligatorio del servicio social en salud del Perú: discriminatorio e inconstitucional. Rev Peru Med Exp Salud Publica. 2014;31(4):781-87. http://www.scielo.org.pe/pdf/rins/v31n4/a26v31n4.pdf

16. Ministerio de Salud de Perú. Resolución Ministerial N°628-2014/MINSA: Aprobar el Reglamento del Consejo Directivo del Residentado Odontológico. CODIRO, 2014.

17. Misrachi-Launert C, Ríos-Erazo M, Manríquez-Urbina JM, Burgos-Ibarra C, Ponce-Espinoza D. Fuentes de estrés percibidas y rendimiento académico de estudiantes de odontología chilenos. FEM. 2015; 18(2):109-16. https://dx.doi.org/10.4321/S2014-98322015000200006

18. Aguilera-Muñoz F, Hermosilla-Oppliger A, Yañez-Yunge L, Uribe-Espinoza S. Factores asociados al éxito académico en estudiantes de odontología durante el ciclo clínico de formación profesional. Rev Electrón Inv Docencia Univ. 2020;2(2):27-44. https://doi.org/10.54802/r.v2.n2.2020.53

19. García L, Moreno V. Factores asociados al rendimiento académico de los estudiantes de odontología en la clínica de crecimiento y desarrollo. Acta Odont Col. 2017;7(1):81-9.

20. Díaz Cárdenas S, Martinez Redondo M, Zapata Teheran AM. Rendimiento académico y calidad de vida relacionada con la salud en estudiantes de odontología. Salud Uninorte. 2017;33(2):139-51. https://doi.org/10.14482/sun.33.2.10540

21. Sarrazola-Moncada AM, Soto-fadul JD, Carmona L, García M, Rojas G, Tabares V, Vásquez M. Trastornos emocionales y rendimiento académico en estudiantes de odontología. Rev Estomatol. 2017;25(2):25-30.

22. Díaz Cárdenas S, Arrieta Vergara K, Simancas-Pallares M. Adicción a internet y rendimiento académico de estudiantes de Odontología. Rev Colomb Psiquiatr. 2019;48(4):198-207. https://doi.org/10.1016/j.rcp.2018.03.002

23. Tamayo-Cabeza G, Hernández-Torres A, Díaz-Cárdenas S. Funcionalidad familiar, soporte de amigos y rendimiento académico en estudiantes de odontología. Univ Salud. 2022;24(1):18-28. https://doi.org/10.22267/rus.222401.263

24. Domínguez-González A, Guzmán-Valdivia-Gómez: G, Linares-Rivera E. Desempeño académico, y su relación con calidad de vida y hábitos saludables. Ed Méd Sup. 2018;33(2). https://ems.sld.cu/index.php/ems/article/view/1673

25. Salinas-Quiroga MD, González-Salazar F. Influencia del trabajo sobre el promedio académico en estudiantes de odontología. Magis. Rev Int Inv Ed. 2019;12(24):41-52.

26. Local AF, Speck M, Pérez E, Mustelier E, Bustabad D. Guía de evaluación para el examen práctico de la asignatura Operatoria Clínica. Rev Inf Cient. 2018; 97(2):476-485.

27. Ali K, Coombes L, Kay E, Tredwin C, Jones G, Ricketts C, Bennett J. Progress testing in undergraduate dental education: the Peninsula experience and future opportunities. Eur J Dent Educ. 2016 Aug;20(3):129-34. doi: 10.1111/eje.12149. Epub 2015 Apr 15. PMID: 25874344.

28. Espinoza-Vázquez O, Sánchez-Mendiola M, Leenen I, Martínez-González A. Evaluación del desarrollo de la competencia clínica en odontopediatría con el examen clínico objetivo estructurado. Inv Ed Med. 2020;9(34):53-62. https://doi.org/10.22201/facmed.20075057e.2020.34.19198

29. Medina D. El rol de las universidades peruanas frente a la investigación y el desarrollo tecnológico. Propós Represent. 2018;6(2):703-77. https://doi.org/10.20511/pyr2018.v6n2.244

30. Mejia CR, Ruiz-Urbina FN, Benites-Gamboa D, Albitres-Flores L, Mena LS, Fasanando-Vela R. Percepciones de utilidad y preparación para el Examen Nacional de Medicina en 10 facultades peruanas, 2017. Educ Med. 2019;20(S1):124-10. https://doi.org/10.1016/j.edumed.2017.10.021

31. Moreno-Loaiza M, Mamani-Quispe PV, Moreno-Loaiza O. Diferencias entre el promedio ponderado promocional y la nota del examen nacional de medicina en el proceso de adjudicación de plazas para el servicio rural y urbano marginal de salud. Rev Peru Med Exp Salud Publica. 2013;30(2):344-64.

32. Pérez-Bejarano N, Gamarra-Insfrán JM, Diaz-Reissner CV, Adorno C, Fretes-López VR, Diaz-Carbajal RC, et al. Depression, anxiety and stress during the COVID-19 pandemic in dental students. Rev Fac Odontol Univ Antioq. 2022; 34(1):14-21.

33. Abbasi MS, Ahmed N, Sajjad B, Aishahrani A, Saeed S, Sarfaraz S, et al. E-Learning perception and satisfaction among health sciences students amid the COVID-19 pandemic. Work. 2020;67(3):549-556.

34. Gómez-Méndez J. Denegatoria de licencia institucional por SUNEDU y cierre de universidades peruanas. Rev La Junta. 2020;3(1):56-63. https://dx.doi.org/10.53641/junta.v3i1.45

35. Córdova MJ, Vásquez AR, Enoki ER. Factores asociados a la calificación del examen nacional de odontología en egresados de una universidad privada, Piura 2017 – 2019 [tesis]. Piura: Universidad César Vallejo; 2019.