Revista de Ciencias Médicas de Pinar del Río

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

ORIGINAL ARTICLE

Assessment of the level of knowledge in oral health among Nursing students at UNIANDES-Ambato University

Gabriela Liseth Vaca-Altamirano[1], Oscar Ismael Ruiz-Ávila[1], Julissa Nicole Moreno-Diaz[1]

[1]Universidad Regional Autónoma De Los Andes. Ambato, Ecuador.

Received: December 16, 2025
Accepted: December 17, 2025
Published: December 18,2025

Citar como: Vaca-Altamirano GL, Ruiz-Ávila OI, Moreno-Diaz JN. Evaluación del nivel de conocimientos en salud bucodental entre estudiantes de Enfermería de la Universidad UNIANDES-Ambato. Rev Ciencias Médicas [Internet]. 2025 [citado: fecha de acceso]; 29(S1): e6990. Disponible en: http://revcmpinar.sld.cu/index.php/publicaciones/article/view/6990

ABSTRACT

Introduction: oral health is an essential component of overall well-being, as its deterioration is associated with multiple systemic diseases and impacts individuals' quality of life.
Objective: to assess the level of knowledge about oral health among Nursing students at UNIANDES-Ambato University.
Methods: an observational, descriptive, cross-sectional study with a mixed approach was conducted in 2024, involving a purposive sample of 109 Nursing students who met the inclusion criteria. Data collection was carried out through a survey, and the information was processed using descriptive statistics. Bioethical principles were respected.
Results: of the participants, 74,31 % were women, and the predominant age group was over 24 years (41,28 %). Regarding knowledge, 93,58 % recognized the relationship between bacteria and dental caries, 96,33 % affirmed that toothbrushing prevents caries, and 66,06 % identified fluoride as a preventive measure. In terms of practices, 73,39 % reported brushing for more than three minutes, and 69,72 % reported changing their toothbrush every 1–3 months. In the overall classification, 79,82 % achieved a good level, 17,43 % a fair level, and 2,75 % a low level.
Conclusions: nursing students demonstrated a predominantly good level of knowledge about oral health, highlighting appropriate hygiene and preventive practices. However, gaps were identified in recognizing the role of fluoride and in specific brushing techniques, underscoring the need to strengthen interdisciplinary training in oral health to optimize comprehensive patient care.

Keywords: Dental Caries; Health Knowledge, Attitudes, Practice; Students, Nursing; Fluorine; Oral Hygiene; Oral Health.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

INTRODUCTION

Higher education focuses on developing skills and competencies in university students to promote their holistic preparation, enabling them to acquire research-related capabilities and, ultimately, become fully qualified health professionals capable of performing their duties effectively.[1] The ongoing improvement of higher education is grounded in the need to train professionals who can respond to current health demands. Professional development entails cultivating habits and abilities that allow individuals to address essential problems within their field of practice.[2]

In this context, it must be acknowledged that oral health is as important as any other aspect of the human body. Nevertheless, in Ecuador, the oral cavity has received insufficient attention and has been historically neglected, resulting in a high prevalence of dental caries and periodontal diseases. Over time, these conditions can lead— as is well known—to systemic diseases that involve far more severe complications, which could have been addressed early through dental care. Thus, oral health is integral to the human life cycle and to overall health; if systemic diseases arise from poor oral conditions, they can significantly impair quality of life.[3]

In this regard, Khan et al.,[4] state that one way to assess knowledge levels is through educational sessions that evaluate basic and structural understanding. Many university professors daily express concerns that students do not independently review academic literature or apply their knowledge. But has the underlying cause been investigated? What is the primary reason for this lack of academic interest in these topics?[5]

Therefore, it is essential that students acquire knowledge about oral health—for example, that periodontal diseases affect 50 % of the global population, with an even higher burden in developing countries. This global issue is highly relevant due to its significant psychosocial impact, which leads to consequences such as gingival bleeding, periodontal abscesses, gum recession, and more. Tooth loss and edentulism affect daily life through aesthetic changes, chewing and nutritional disorders, and can also trigger anxiety, depression, and social vulnerability—all of which deteriorate quality of life.[6]

In Ecuador, there are thousands of skilled and competent health professionals recognized for the quality of their medical care. However, the COVID-19 pandemic, which claimed thousands of lives and disrupted multiple sectors—including higher education—forced institutions to shift to fully virtual instruction for over a year. This has left a gap in the professional training of university students, causing concern among university authorities and faculty members. This context motivated the present study, which aimed to assess the level of oral health knowledge among Nursing students at UNIANDES-Ambato University.

METHODS

An observational, descriptive, cross-sectional study with a mixed-methods approach was conducted. This design was selected because it allowed for a precise characterization of nursing students' knowledge, attitudes, and practices regarding oral health, without manipulating variables and ensuring representative data collection at a single point in time.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

The research was carried out at the Autonomous Regional University of the Andes (UNIANDES), Ambato campus, Ecuador, between January and June 2024. The population consisted of students officially enrolled in the Nursing program.

Inclusion criteria were: active enrollment in the 2024 academic period, age ≥18 years, and provision of informed consent. Students who did not complete the survey or declined to participate were excluded. The final sample comprised 109 students, selected through intentional sampling, as the aim was to evaluate all available students who met the inclusion criteria.

Procedures and Techniques
Data collection was performed using a structured questionnaire. This instrument enabled the collection of information on the following variables: age, sex, oral health knowledge, attitudes toward oral health, oral hygiene practices, and overall knowledge level. For the latter, responses in the knowledge section were scored as 0 (incorrect/don't know) or 1 (correct), yielding a total score ranging from 0 to 10 points. Knowledge levels were categorized as follows: **good** (≥7 points), **fair** (5–6 points), and **low** (≤4 points).

Statistical Analysis
Data were recorded in Microsoft Excel spreadsheets and subsequently processed using IBM SPSS Statistics software, version 25. Descriptive statistics were applied to analyze the variables, including absolute frequencies, percentages, and measures of central tendency and dispersion. No hypothesis testing was performed, given the descriptive nature of the study. A significance level of 0,05 was established for exploratory analyses. Missing data were handled through case exclusion, and internal consistency of the questionnaire was verified by double-checking the databases.

Ethical Considerations
The study received approval from the Ethics Committee of UNIANDES-Ambato University. All participants provided written informed consent prior to inclusion. Confidentiality of information and data anonymity were guaranteed. The research complied with the principles of the Declaration of Helsinki and current national regulations for research involving human subjects.

RESULTS

Table 1 shows the sample distribution by age and sex. Female participants were more representative (74,31 %), with the age group >24 years being the most prevalent (41,28 %).

Table 1. Sample distribution by age and sex.

Variable		No.	%
Sex	Female	81	74,31
	Male	28	25,69
Age	18–20 years	33	30,28
	20–24 years	31	28,44
	>24 years	45	41,28

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

Table 2 shows that 93,58 % of respondents recognized that bacteria cause dental caries. Additionally, 86,24 % affirmed that natural teeth are better than dentures, and 96,33 % believed that toothbrushing can prevent caries. Regarding flossing, 87,16 % considered it valuable for caries prevention. Furthermore, 66,06 % recognized fluoride as an effective preventive measure, and 90,83 % associated bleeding during brushing with gum disease. A total of 79,82 % attributed gum disease to poor dental hygiene, while 69,72 % believed brushing helps prevent it. Conversely, 30,28 % incorrectly stated that brushing does *not* prevent gum problems. Moreover, 92,66 % considered maintaining natural teeth very important, and 99,08 % reported using a toothbrush as part of their oral hygiene routine.

Table 2. Oral health knowledge among Nursing students.

Question	Response	n	%
Do bacteria (germs) on teeth cause caries?	True	102	93,58
	False / Don't know	7	6,42
Are natural teeth better than false (artificial) teeth?	True	94	86,24
	False / Don't know	15	13,76
Can brushing your teeth prevent caries?	True	105	96,33
	False / Don't know	4	3,67
Can dental floss prevent caries?	True	95	87,16
	False / Don't know	14	12,84
Does fluoride use prevent caries?	True	72	66,06
	False / Don't know	37	33,94
Can bleeding during brushing be a sign of gum disease?	True	99	90,83
	False / Don't know	10	9,17
Can gum disease be caused by poor dental hygiene?	True	87	79,82
	False / Don't know	22	20,18
Brushing teeth does *not* prevent gum problems	True	33	30,28
	False / Don't know	76	69,72
Keeping natural teeth is *not* that important	True	9	8,26
	False / Don't know	101	92,66
Do you use a toothbrush in your oral hygiene routine?	Yes	108	99,08
	No / Maybe	1	0,92

Table 3 shows that the majority of students perceived they take good care of their teeth (66,98 %) and placed high value on oral hygiene (76,15 %) and maintaining healthy conditions (77,06 %). However, more than half acknowledged having only fair knowledge about gum diseases (57,80 %). Regarding practices, toothpaste and water were the most commonly used (97,25 %), with a preference for fluoride-containing toothpastes (63,30 %). Toothbrushing duration exceeded three minutes for 73,39 % of students, and 69,72 % replaced their toothbrush every 1–3 months. The most frequently used brushing technique involved vertical (up-and-down) movements (70,64 %), although 26,61 % still used horizontal strokes. These results reflect positive attitudes and mostly adequate habits, yet they also reveal gaps in periodontal knowledge and in proper brushing technique—areas that require reinforcement in preventive education.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

Table 3. Attitudes and practices of students regarding their oral hygiene.

Attitudes and practices	Category	n	%
How well do you think you take care of your teeth?	Very well	21	19,26
	Well	73	66,98
	Fair	15	13,76
	Poor	0	0
My knowledge about gum diseases is	Very good	4	3,67
	Good	40	36,70
	Fair	63	57,80
	Poor	2	1,83
How important is it for you to clean your teeth?	Very important	83	76,15
	Important	36	33,03
	Fair	0	0
	Poor	0	0
How important is it for you to have healthy oral conditions?	Very important	84	77,06
	Important	25	22,94
	Slightly or not important	0	0
What is the most important factor for your future oral health?	My own efforts	69	63,30
	The dentist	40	36,70
What elements do you use to brush your teeth?	Water only	3	2,75
	Toothpaste and water	106	97,25
	Nothing	0	0
What type of toothpaste do you use?	Fluoridated	69	63,30
	I don't know	40	36,70
What do you consider the appropriate brushing duration?	<3 minutes	29	26,61
	>3 minutes	80	73,39
At what time of day do you brush your teeth?	Morning and night	60	55,05
	Only morning	2	1,83
	Only night	1	0,92
	After every meal	46	42,20
How often do you change your toothbrush?	Every 1–3 months	76	69,72
	Every 4–6 months	29	26,61
	Every 7–12 months	2	1,83
	After 1 year	1	0,92
	I don't know	1	0,92
What brushing technique do you use?	Horizontal movements	29	26,61
	Up-and-down movements	77	70,64
	I don't follow any technique	3	2,75

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

Figure 1 shows the results of oral health knowledge, revealing that 79,82 % of students have a good knowledge level, while 17,43 % have a fair level.

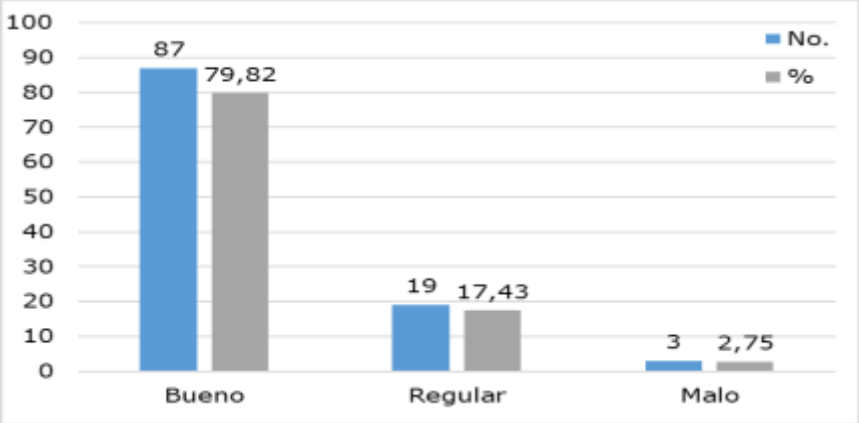

Fig. 1 Distribution of the sample according to oral health knowledge level.

DISCUSSION

In their study, Catalá and Cortés,[7] state that dental caries is caused by acid-producing bacteria and is a multifactorial pathology that includes causal factors, pathogenesis, clinical manifestations, and predisposing risk factors. Vaca et al.,[8] mention that the consumption of low-cost, carbohydrate-rich foods—commonly incorporated into the diet—takes longer to be cleared from tooth surfaces, leading to greater demineralization and increased caries risk. Our findings corroborate this, as 93,58 % of participants correctly identified bacteria as the cause of dental caries.

Current public health philosophy promotes a culture of oral health at home focused on proper nutrition and comprehensive hygiene.[7] This aligns with our results: 79,82 % of students recognized that gum disease can result from poor dental hygiene, and 69,72 % affirmed that toothbrushing helps prevent gum problems. Furthermore, it is widely understood that maintaining proper oral hygiene habits is the best guarantee against both dental and periodontal issues.[9,10]

Vaca et al.,[8] also note that adequate fluoride intake—whether through fluoridated water or toothpaste—makes enamel more resistant and less susceptible to caries. The literature reports that community water fluoridation can reduce caries incidence by up to 60 %, confirming dental caries as a preventable disease.[11,12] In our study, 66,06 % of students acknowledged that fluoride prevents caries. It is now widely accepted that plaque control without fluoride has limited preventive effect against caries, making fluoride a cornerstone of caries prevention and essential for maintaining healthy dentin.

Canales and Cooper,[13] found in their population that 91,7 % of students believed bleeding during brushing was normal—a finding directly opposite to ours, where 90,83 % of participants correctly identified bleeding as a sign of gum disease, demonstrating awareness that gingival bleeding is not normal.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

Pérez,[14] states that the Bass technique is the most widely recommended by oral health professionals due to its superior effectiveness in bacterial plaque removal. This coincides with our results: 70,64 % of students use up-and-down brushing movements, which characterize the Bass technique.

Pérez et al.,[15] recommend brushing at least twice daily for 2–3 minutes with gentle pressure using the Bass technique or its modifications. Our results show that 73,39 % of participants brush for three minutes or longer, suggesting an adequate understanding of optimal brushing duration for maintaining ideal oral health and preventing future complications.

According to Solis G,[16] toothbrushes should be replaced every three months because they typically retain their shape and functional properties for approximately 12 weeks, although in many cases they begin to degrade as early as 8 weeks. In our study, 69,72 % of participants reported changing their toothbrush every 1–3 months, indicating that most replace it within a timeframe that prevents microbial accumulation and avoids damage to oral tissues from worn bristles.

The knowledge demonstrated in this study may be attributed to the fact that, although these students are not enrolled in dentistry, they belong to the broader health sciences field and already possess foundational knowledge of oral health—sufficient to yield the positive results observed.

CONCLUSION

The study conducted among Nursing students at the Autonomous Regional University of the Andes (UNIANDES) revealed that, overall, they possess adequate knowledge of oral health. They recognize dental caries as an infectious oral disease linked to carbohydrate consumption and bacterial activity causing enamel demineralization, and they identify preventive measures such as proper brushing and fluoride use. These findings reflect favorable theoretical training. However, it is recommended to complement this knowledge with clinical assessments to verify whether this understanding effectively translates into self-care practices and improved oral health outcomes.

BIBLIOGRAPHIC REFERENCES

1. Ramirez P. Desarrollo de capacidades de investigación para estudiantes universitarios mediante el uso de estrategias instruccionales en entornos virtuales de aprendizaje. Apertura[Internet]. 2020[Citado 10/12/2025]; 12(1). Disponible en: http://www.udgvirtual.udg.mx/apertura//index.php/apertura/article/view/1842

2. Pérez Pino M, Enrique Clvero JO, Carbò Ayala JE, Gonzàlez Falcòn M. La evaluación formativa en el proceso enseñanza aprendizaje. EDUCENTRO[Internet]. 2017[Citado 10/12/2025]; 9(3): 263-283. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2077-28742017000300017

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

3. Villalon P, Abad L, Hernández G. Percepción de pacientes respecto a la enfermedad periodontal en la Clínica Estomatológica Docente "Julio Antonio Mella", Guantánamo. Rev Inf Cient[Internet]. 2020[Citado 10/12/2025]; 99(4): 349-358. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1028-99332020000400349

4. Khan M, Usman M. Education Quality and Learning Outcomes in Higher Education Institutions in Pakistan. Taylor's 7th Teaching and Learning Conference 2014 Proceedings: Holistic Education: Enacting Change. Singapore: Springer Singapore[Internet]; 2015[Citado 10/12/2025]. Disponible en: https://link.springer.com/chapter/10.1007/978-981-287-399-6_41

5. Santa Cruz González NO, Pérez Aquino CF, Villagra Rivera N, Achucarro Galeano S. Nivel de conocimientos y prácticas sobre salud bucodental de estudiantes de posgrado de la Carrera de Enfermería de la Facultad de Ciencias de la Salud de la Universidad Católica de Asunción. Mem. Inst. Investig. Cienc. Salud[Internet]. 2019[Citado 10/12/2025]; 17(2): 56-63. Disponible en: https://doi.org/10.18004/mem.iics/1812-9528/2019.017.02.56-063

6. Marques AP. Association of clinical, social and enviromental variables with dental caries prevalence in adolescents from a Brazilian municipality supplied with fluoridated water. Cad Saúde Colet[Internet]. 2021[Citado 10/12/2025]; 29(4). Disponible en: https://doi.org/10.1590/1414-462X202129040345

7. Catalá M, Cortés O. La caries dental: una enfermedad que se puede prevenir. An Pediatr Contin[Internet]. 2014[Citado 10/12/2025]; 12(3): 147-51. Disponible en: https://www.elsevier.es/es-revista-anales-pediatria-continuada-51-pdf-S1696281814701842

8. Vaca G, Cubi D, Mena P. PREVALENCIA EN EL CUIDADO DENTAL E HIGIENE DE LOS ESTUDIANTES EN TIEMPO DE CUARENTENA. Revista Conrado[Internet]. 2022[Citado 10/12/2025]; 18(S2): 146-151. Disponible en: https://conrado.ucf.edu.cu/index.php/conrado/article/view/2451/2375

9. Artés J, Pedraja-Chaparro F, del Mar J. Research performance and teaching quality in the Spanish higher education system: Evidence from a medium-sized university. Research Policy[Internet]. 2017[Citado 10/12/2025]; 46(1): 19-29. Disponible en: https://www.sciencedirect.com/science/article/abs/pii/S0048733316301664

10. Becerra P, Parra A,Jouannet J. Conocimiento, actitudes y prácticas en salud oral en adolescentes de 12 y 15 años d e la localidad de Fresia. Rev Chilena de Salud Pública[Internet]. 2014[Citado 10/12/2025]; 18(2): 140-148. Disponible en: https://doi.org/10.5354/0719-5281.2014.31975

11. Renyer K, McFadden P. The Dental Fluoridation Potential of Drinking Water. Compend Contin Educ Dent[Internet]. 2022 Apr[Citado 10/12/2025]; 43(4): E5-eE8. Disponible en: https://pubmed.ncbi.nlm.nih.gov/35334199/

12. Taher MK, Momoli F, Go J, Hagiwara S, Ramoju S, Hu X, Jensen N, Terrell R, Hemmerich A, Krewski D. Systematic review of epidemiological and toxicological evidence on health effects of fluoride in drinking water. Crit Rev Toxicol[Internet]. 2024 Jan[Citado 10/12/2025];54(1):2-34. Disponible en: https://doi.org/10.1080/10408444.2023.2295338

13. Canales D, Cooper F. Conocimiento estudiantil sobre enfermedad periodontal e inclusión de temas de salud oral en carreras de la salud. Innovare: Rev Cienc Tecnol[Internet]. 2019[Citado 10/12/2025]; 8: 81-87. Disponible en: https://revistas.unitec.edu/innovare/article/view/86/70

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6990

14. Rizzo L, Torres A, Martinez C. Comparación de diferentes técnicas de cepillado para la higiene bucal. CES Odontología[Internet]. 2016[Citado 10/12/2025]; 29(2): 52-64. Disponible en: http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0120-971X2016000200007&lng=en&tlng=es.

15. Pérez N, Ferreira M, Alarcón V. Comparación del tiempo de cepillado de la técnica habitual con la técnica de Bass en estudiantes de Odontología. Mem Inst Invest Cienc Salud[Internet]. 2016[Citado 10/12/2025]; 14(3): 81-85. Disponible en: https://pesquisa.bvsalud.org/portal/resource/essiqueira/biblio-869102

16. Solis G, Pesaressi E, Mormontoy W. Tendencia y factores asociados a la frecuencia de cepillado dental en menores de doce años, Perú 2013-2018. Rev Peru Med Exp Salud Pública[Internet]. 2019[Citado 10/12/2025]; 36(4): 562-572. Disponible en: https://doi.org/10.17843/rpmesp.2019.364.4888