Correlation Between Attitude and Environmental Behavior in Nursing Students of a Public University in Peru

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Posted Date: 9 April 2026

doi: 10.20944/preprints202604.0643.v1

Keywords: attitudes; behavior; environment; university students

 doi:10.20944/preprints202604.0643.v1

Article

Correlation Between Attitude and Environmental Behavior in Nursing Students of a Public University in Peru

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Abstract

Environmental attitude and behaviour play a vital role in developing a responsible and environmentally sustainable culture**. Objective**: To determine the correlation between attitudes and environmental behavior in nursing students of a public university in Peru. **Material and Methods**: Observational, analytical, correlational and prospective study, population made up of 450, sample of 207 students, using as an instrument 2 nationally validated questionnaires, adapted to our reality, applying a pilot test to 15% of the sample, reporting the Cronbach's Alpha coefficient of (0.784) and (0.873), (attitudes and behavior), respectively. **Results**: The age group of 20-24 years (46.2%) and female sex (79.7%) predominated, $\bar{X}$=20.56 SD = 2.875. The descriptive results show that the environmental attitudes of the students are predominantly characterized by an "unfavorable" attitude (52.7%), when analyzing by dimensions, it is observed that the cognitive attitude is favorable (75.8%), the behavioral and affective attitude is unfavorable (79.2%) and (61.4%) respectively. The environmental behavior of students is predominantly evaluated as "good" (55.1%), "fair" behavior (42.5%), and "poor" behavior (2.4%). **Conclusion**: Pearson's correlation analysis revealed a moderately and statistically significant positive relationship between environmental attitudes and environmental behavior in students of the Peruvian public university ($r = 0.469$, $p < 0.001$). This result indicates that, as students' environmental attitudes become more favorable, their environmental behavior also tends to improve.

Keywords: attitudes; behavior; environment; university students

1. Introduction

Today, humanity is facing a growing variety of emerging environmental challenges. Despite their great importance, nurses often ignore ecological aspects, which can put patients' health at risk and, therefore, affect our population [1]. It is estimated that approximately 12.5 million deaths annually, equivalent to about 25% of global mortality, are the result of unhealthy environments, according to the latest report by the World Health Organization (WHO) [2]. Likewise, in an additional report, the (WHO) points out that, with respect to the burden of disease associated with environmental risks, nurses, as professionals on the front line, have a unique opportunity to promote sustainable initiatives. Although collaboration with other health professionals is essential, nurses' involvement in sustainable practices is affected by a complex interplay between attitudes, practices, obstacles and facilitators that is still insufficiently understood [3]. Thus, the United Nations (UN) has pointed out that the planet faces a triple crisis: climate change, the decline of biodiversity and pollution along with waste. The global economy continues to deplete increasing natural resources, while no adequate progress is being made towards meeting the Sustainable Development Goals (SDGs) [4–7]. The growing need for resources, driven by forced urbanization, industrialization and

 doi:10.20944/preprints202604.0643.v1

population growth, is generating serious repercussions for society, such as declining biodiversity, water stress, climate change and air pollution [8].

Approximately 4.4 billion people, representing more than half of the world's population, currently reside in urban areas. It is estimated that this figure could grow to about 70% by 2050 [9]. There is a growing body of evidence that makes a connection between the health of the planet, particularly environmental factors, and mental health. Air pollution, environmental noise, and exposure to high temperatures impact both physical and mental health through different mechanisms, including increased stress and anxiety, as well as inflammation and oxidative stress [10,11]. Physical discomfort is on the rise globally, but little is known about its connection to rising temperatures. Using data collected from daily surveys of more than 2 million U.S. residents, covering 26,987 zip codes between 2008 and 2017, they investigated whether warmer days are associated with a higher number of pain reports [12]. Likewise, the increase in global temperature, with 2024 being considered the warmest year to date, highlights the essential connection between environmental problems and kidney health. Extreme heat, a consequence of global warming, causes various effects on human physiology, including alterations in kidney function. Research has pointed to the physiological and molecular mechanisms linked to kidney damage caused by heat stress, ranging from acute kidney injury to chronic kidney disease (CKD) and the formation of urinary stones [13].

In this context, the UNESCO report highlights that the oceans continue to be fundamental in their function as carbon sinks, as they absorb large volumes of this gas. Statistics reveal that annually the sea retains about 25% of the anthropogenic emissions of carbon dioxide (CO2) that are released into the atmosphere. Although this absorption capacity helps to reduce the effect of climate change, the document points out that it also causes ocean acidification [14,15].

Therefore, the environmental situation in Latin America and the Caribbean is becoming increasingly worrying. This region has abundant natural resources and rich biodiversity, however, despite the efforts of governments, there is a deterioration that advances relentlessly. Globally, environmental deterioration is alarming; has reached a new state ("non-analogous state") in which climatic conditions and other environmental variables have exceeded established limits for at least the last five hundred thousand years [16].

1.1. Theoretical Framework

1.1.1. Attitudes

Attitude towards the environment is an indicator of environmental behavior and is manifested in pro-environmental action and regulations [17]. Attitude is composed of three aspects: affective, cognitive, and behavioral, which are linked to each other [18]. In the context of the study, environmental attitudes must be taken into account, which are value judgments associated with the beliefs, feelings and values that an individual has towards the environment and their concern to conserve and protect it, influencing our pro-environmental behaviors [19].

In essence, a positive attitude is characterized by concern for its conservation and the appreciation of environmental sustainability. Conversely, a negative environmental attitude can lead to inaction or behaviours that contribute to environmental degradation [20].

The study of environmental behavior in is essential to understand how young people interact with their environment and develop sustainable habits [21]

1.1.2. Environmental Behavior

A concept of vast scope, it encompasses both the manifest actions of an individual, that is, his observable behaviors. This notion encompasses the way in which a person relates to his or her environment, including his or her social interactions and affective reactions to various situations [22]. In our perspective, it is defined as the actions of individuals who are actively involved in the conservation of the environment in their daily lives [23].

 doi:10.20944/preprints202604.0643.v1

1.2. Literature Review

Research such as the De Sousa et al. results indicate that the majority of students possess significant knowledge about the environment, show respectful attitudes towards it, and adopt responsible practices, such as proper use of paper, efficient energy consumption, and recycling. In general, university students are aware of the importance of protecting the environment and are well informed about environmental issues. It is concluded that it is essential to pay more attention to higher education institutions (HEIs) due to their great potential to educate and prepare future leaders in decision-making in society, in order to promote a more sustainable approach to the environment. It is suggested that higher education plays a crucial role in the formation of individuals committed to environmental sustainability [24].

Juma et al., analyzed the sequence of 'beliefs-attitudes-behaviors' through the application of the Theory of Planned Behavior in the university environment. This study examined the relationships proposed using the least squares method on a sample that included 1991 responses from students and staff from nine universities in Latin America. The results suggest that both beliefs and attitudes positively influence the intrinsic motivation to participate in activities related to climate change; In addition, this intrinsic motivation, together with attitudes, affects pro-environmental behavior within the university community. In contrast, it was found that neither extrinsic motivations nor individual pro-environmental behavior have an impact on the behaviors of the members of said community. [Question 25].

Pulido et al. carried out a descriptive and cross-sectional research. This study indicates that female students show greater commitment when expressing their interest in ecology, as well as in activities such as recycling disposable and biodegradable materials. In addition, it was observed that they tend to turn off the lights, manage the use of water during the washing of dishes and clothes, as well as in their personal hygiene, in addition to preferring products that do not harm the environment. On the other hand, men have a higher interest in consuming programs related to ecology or the environment. These findings suggest that attitudes and behaviors towards environmental sustainability invite reflection on current patterns of production and lifestyle among university students[26].

1.3. Context in Peru

A few days before the end of 2023, Peru's Congress made modifications to the Forestry and Wildlife Law that have generated controversy and concern among specialists and environmental organizations. This decision represents a significant weakening of the country's environmental legislation. Thus, at the beginning of 2024, there are less solid environmental regulations, just at a time when the fight against climate change and compliance with international commitments should be priorities [27].

Peru is facing a crisis of environmental pollution derived from human activities, which affect soil, air and water, causing a risk to the health of the population [28].

The Peruvian Amazon, renowned for its vast biodiversity, faces serious threats due to illegal logging and mining. These actions can lead to the degradation of Amazonian ecosystems, negatively impacting the environment and the biological diversity that provides fundamental services such as water purification and climate balance [29,30].

Therefore, in order to achieve sustainability in the face of serious ecological disasters that may arise, education focused on respect for and awareness of the natural environment is essential [31]. Thus, research indicates that students, acting as agents of change and critical thinkers, play a crucial role in the creation of a responsible and sustainable culture towards the environment [31,32]. An environmentally friendly disposition is essential, as it allows them to acquire knowledge about resource management, energy efficiency and ecological practices. This in turn facilitates the adoption of behaviors that benefit the environment, extending beyond their immediate environment. Likewise, a positive environmental attitude not only promotes the conservation of the natural environment, but also contributes to emotional and physical well-being [33,34]. The relationship with the natural

 doi:10.20944/preprints202604.0643.v1

environment and involvement in environmental conservation activities have shown positive effects on public health and on the strengthening of the sense of community among university students [34-37].

1.4. Justification of the Study

The study has a significant contribution, since, by determining the relationship between environmental attitude and behavior in students of a Public University of Peru, it will lead us to identify deficiencies or gaps existing in the student environment, as well as to be able to influence the application of educational programs of promotion and prevention in students and apply corrective measures and implement improvements related to the care of human and environmental health. thus protecting the planet Earth.

1.5. Objectives of the Study

The objective of this study was to determine the relationship between environmental attitudes and behavior in students of a public university in Peru (1), to evaluate environmental attitudes and behavior in students of a public university in Peru (2), to determine the relationship between cognitive, affective and behavioral attitude and environmental behavior in students of a public university in Peru (3)

1.6. Study Hypothesis

There is a significant association between environmental attitude and behavior in students of a public university in Peru.

Specific Hypotheses.

HA1. There is a significant association between cognitive attitude and environmental behavior in students of a public university in Peru.

HA2. There is a significant association between affective attitude and environmental behavior in students of a public university in Peru.

HA3. There is a significant association between behavioral attitude and environmental behavior in students of a public university in Peru.

2. Materials and Methods

Relational observational research because they describe and analyze the correlations between the variables (attitude and behavior), without intervening in them, analytical, because it involves relating the variables and establishing associations using inferential, cross-sectional and prospective statistics because the data were collected at a given time.

2.1. Study Population: Made Up of All Students of the Faculty of Nursing of the Universidad Nacional San Luis Gonzaga. In Total 450 Students. The Sample Frame Was Made Up of Students Enrolled in the Academic Semester 2025-I

2.2. Sample: The Sample Size Was Calculated Using a Statistical Formula for Finite Population. The Analysis Unit Is Made Up of Students from the Faculty of Nursing of the Universidad Nacional San Luis Gonzaga. The Sampling Unit Consisted of University Students Who Were Surveyed to Determine Environmental Attitudes and Behaviors. The Sample Size Was Calculated Using a Statistical Formula for Finite Population with a Standard Error of 0.5, Which Resulted in 207 Students

Inclusion criteria: Students enrolled in the current **cycles** I, II, III, IV, VI and IX of the Faculty of Nursing of the Universidad Nacional San Luis Gonzaga de Ica during the academic semester 2025-I. Students who agree to participate in the research and who sign the informed consent document.

Exclusion criteria:

Students who do not wish to participate in the study

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Students from other majors
Students with disabilities to develop the questionnaire

2.3. Data Collection Techniques. The Technique of Quantitative Data Collection Was Executed Through the Application of the Survey to the Students of the Faculty of Nursing of the National University "San Luis Gonzaga", Who Were Randomly Selected by Cycle After Interviewing

2.4. Data Collection Instruments: The Instrument Used Was the "Questionnaire", Made Up of the Following Parts:

1.-. General data on adolescents: Age, sex, marital status and cycle of studies.

2.-. Environmental attitudes questionnaire: An instrument of national origin was used, which measures environmental attitudes in university students, its authors being Mencia et al. (38) in 2023. Its characteristics are: Structure: Made up of 19 items divided into 3 dimensions: Cognitive attitude (7 items), affective attitude (5 items) and behavioral attitude (7 items). Validity and reliability: Mencia et al. validated the questionnaire by experts in the field, obtaining a significant result in content agreement ($p<0.05$). In turn, Mencia et al. (37) report its reliability using Cronbach's alpha is greater than 0.80. In the present study, the reliability of the questionnaire was confirmed in a pilot test with 10% of the sample, obtained by Cronbach's Alpha = 0.784 for the attitudes variable and 0.873 to 21 university students for the behavior variable.

Answer alternatives: With Likert design of 5 alternatives: Never (1), almost never (2), regularly (3), almost always (4) and always (5).

Levels and scores: Attitudes were analyzed in 3 levels (favorable, unfavorable and unfavorable), their scores were determined according to the interval technique, with equal proportions in each level in an ascending manner, applying the following formula:

$$\frac{Valor\ máximo - valor\ mínimo}{Número\ de\ niveles}$$

	Favorable	Unfavorable	Unfavorable
Environmental attitudes	19-45 pt	46-70 pt	71-95 pt,
D1. Cognitive attitude	7-17 pt	18-26 pt	27-35 pt.
D2. Affective attitude	5-12 pt	13-19 pt	20-25 pt.
D3. Behavioral Attitude	7-17 pt	18-26 pt	27-35 pt

3. Environmental Performance Questionnaire

Instrument of national origin, which measures environmental attitudes in university students, its authors being Mencia et al. (38) in 2023. Its characteristics are:

Structure: Made up of 14 items divided into 6 dimensions: Recycling (3 items), energy consumption (2 items), water consumption (2 items), transportation and environment (2 items), responsible consumption of products (3 items), and participation (2 items).

Validity and reliability: Mencia et al. validated the questionnaire by experts in the field, obtaining a significant result in content agreement ($p<0.05$). In turn, Mencia et al. report its reliability using Cronbach's alpha is greater than 0.80. In the present study, the reliability of the questionnaire was confirmed by Cronbach's Alpha 0.873 in a pilot test with 10% of the sample of 21 university students

Answer alternatives: With Likert design of 5 alternatives: Never (1), almost never (2), regularly (3), almost always (4) and always (5).

Levels and scores: Environmental behavior will be measured in 3 levels (Good, Fair and Poor), and their scores were determined according to interval technique, with equal proportions in each level in an ascending manner, applying the following formula:

$$\frac{Valor\ máximo - valor\ mínimo}{Número\ de\ niveles}$$

Poor Regular Good

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Environmental performance	14-33 points		34-52 points		53-70 points	
D1. Recycling	3-7	8-11		12-15		
D2. Power consumption	2-4		5-7		8-10	
D3. Water consumption	2-4	5-7		8-10		
D4. Transport and the environment	2-4	5-7		8-10		
D5. Responsible consumption of products	3-7		8-11		1 2-15	
D6. Participation	2-4	5-7		8-10		

2.5. Data Processing, Analysis and Interpretation Techniques:

2.5.1. Information Coding Technique: They Were Tabulated in the Excel 2021 Program, Assigning the Corresponding Coding with the Arabic Method, Which Allowed the Information to Be Properly Systematized

Quantitative analysis: The data were taken to the specialized program SPSS Version 27, obtaining quantitative data (frequencies and percentages) for each variable based on the score, which were reflected in graphs and/or tables.

Correlational (inferential) statistical analysis: An appropriate statistical test was run according to the result of the data normality test with the Kolmogorov-Smirnov statistic. The data come from a normal distribution and the Rho Spearman test was selected.

The results show that the total sample was made up of 207 cases, which were considered 100% valid for all the variables analyzed. Likewise, no missing cases (0.0%) were recorded in any of the dimensions evaluated.

This indicates that all questionnaires were correctly completed, allowing the use of the entire sample for subsequent statistical analyses. Consequently, the quality of the data is adequate, as it was not necessary to exclude observations or apply missing data imputation techniques.

The absence of missing data strengthened the internal validity of the study and ensured that the results obtained fully reflect the participants' responses, increasing the reliability of the descriptive and inferential analyses performed.

2.6. Ethical Considerations of the Project. – The Following Research Work Was Developed Taking into Account the Points Referred to Informed Consent, Confidentiality of Information and Minimization of Risks. As Well as the Set of Ethical Principles for Research Involving Human Beings Established in the Declaration of Helsinki and Adapted by the World Medical Association (WMA) Since 1964

3. Results

3.1. Description of the Sample and Spearman's Correlation with Attitudes

The sociodemographic characteristics according to students' environmental attitudes are mainly concentrated in the unfavorable category, followed by the favorable attitude, while the unfavorable attitude presents a minimal frequency. According to age, the 18 to 24 age groups concentrate the highest proportion of responses. Regarding sex, women predominate because they represent the majority of the sample. In relation to marital status, most of the students are single, who mainly present unfavorable attitudes. Finally, Spearman's correlation analysis indicates that there is no statistically significant relationship between sociodemographic characteristics and environmental attitudes. Table 1.

 doi:10.20944/preprints202604.0643.v1

Table 1. Environmental attitudes according to sociodemographic characteristics.

Sociodemographic characteristics	Environmental attitudes							Spearman's correlation
	Favorable		Unfavorable		Unfavorable		Total	
	N°	%	N°	%	N°	%		
Age								
18–19 years old	41	19.8	49	23.7	3	1.4	93	rs = -0.138
20–24 years	45	21.7	48	23.2	3	1.4	96	p = 0.048
25–29 years	6	2.9	9	4.3	1	0.5	16	
30–37 years	1	0.5	3	1.4	0	0.0	2	
Sex								
Male	13	6.3	28	13.5	1	0.5	42	rs = -0.103
Female	80	38.6	81	39.1	4	1.9	165	p = 0.140
Marital status								
Single	91	44.0	106	51.2	5	2.4	202	rs = 0.020
Married	1	0.5	1	0.5	0	0.0	2	p = 0.742
Cohabitant	1	0.5	2	1.0	0	0.0	3	
Cycle of studies								
I	18	8.7	20	9.7	1	0.5	39	rs = -0.145
II	18	8.7	21	10.1	1	0.5	40	p = 0.038
III	22	10.6	15	7.2	2	1.0	39	
IV	14	6.8	9	4.3	1	0.5	24	
VI	16	7.7	14	6.8	0	0.0	30	
X	21	10.2	13	6.3	1	0.5	35	
TOTAL	**93**	**44.9**	**109**	**52.7**	**5**	**2.4**	**207**	

Source: Data collection instrument.

3.2. Description of the Sample and Spearman's Correlation with Environmental Behavior

The predominant environmental performance is good, followed by the regular level, while the poor performance presents a minimal proportion. Students aged 18 to 24 concentrate the highest number of positive environmental behaviors, and women have higher percentages due to their greater representation in the sample. Likewise, most of the students are single, who mainly show good and regular environmental behaviors. Finally, Spearman's analysis shows that there is no statistically significant relationship between sociodemographic characteristics and environmental behavior. Table 2

Table 2. Environmental behaviors according to sociodemographic characteristics.

Sociodemographic characteristics	Environmental performance							Spearman's correlation
	Good		Regular		Poor		Total	
	N°	%	N°	%	N°	%		
Age								
18–19 years old	51	24.6	39	18.8	3	1.4	93	rs = -0.055
20–24 years	50	24.2	44	21.3	2	1.0	96	p = 0.428
25–29 years	10	4.8	6	2.9	0	0.0	16	
30–37 years	3	1.4	1	0.5	0	0.0	2	
Sex								
Male	22	10.6	18	8.7	2	1.0	42	rs = 0.033
Female	92	44.4	70	33.8	3	1.4	165	p = 0.637
Marital status								
Single	112	54.1	85	41.1	5	2.4	202	rs = -0.114

 doi:10.20944/preprints202604.0643.v1

Married		1	0.5	1	0.5	0	0.0	2	p = 0.103
Cohabitant		1	0.5	2	1.0	0	0.0	3	
Cycle of studies									
I		18	8.7	20	9.7	1	0.5	39	rs = -0.099
II		18	8.7	21	10.1	1	0.5	40	p = 0.158
III		22	10.6	15	7.2	2	1.0	39	
IV		14	6.8	9	4.3	1	0.5	24	
VI		16	7.7	14	6.8	0	0.0	30	
X	21	10.2		13	6.3	1	0.5	35	
TOTAL	**114**	**55.1**		**88**	**42.5**	**5**	**2.4**	**207**	

Source: Data collection instrument.

3.3. Descriptive Statistics on the Dimensions of Environmental Attitude

When analyzing by dimensions, it is observed that the cognitive attitude presents the most favorable mean (1.27), which indicates that students have a good level of knowledge and beliefs about environmental issues. In contrast, behavioral attitude shows the least favorable mean (2.00), suggesting that, although students know about environmental problems, their actual willingness to adopt pro-environmental behaviors is more limited. The affective attitude occupies an intermediate position (1.68), reflecting moderately favorable feelings and emotions towards the environment. These findings suggest that there is a disconnect between environmental knowledge and behavioral disposition, which could explain why general attitudes are not as favorable as might be expected Table 3.

Table 3. Descriptive statistics of the dimensions of environmental attitude.

Descriptive statistics					
	N	Minimum	Maximum	Media	Standard deviation
Cognitive Attitude	207	1	3	1,27	,495
Affective Attitude	207	1	3	1,68	,535
Behavioral Attitude	207	1	3	2,00	,457
N valid (per list)	207				

3.4. Descriptive Statistics with the Dimensions of Environmental Behavior

When examining the specific dimensions, it is highlighted that behaviors related to energy (mean=1.21) and water (mean=1.22) consumption are the most favorable, suggesting that students have efficient practices in the use of these resources. On the other hand, the dimensions with the worst results are recycling (mean=1.72), responsible consumption of products (mean=1.72) and participation in environmental activities (mean=1.70), indicating areas of opportunity for improvement. Transport-related behavior (mean=1.68) also shows intermediate performance. These results reveal that, although students have good habits in the basic consumption of resources, they present greater difficulties in more complex practices such as recycling, responsible consumption and active participation in environmental initiatives Table 4

Table 4. Descriptive statistics of dimensions in environmental behavior.

Descriptive statistics					
	N	Minimum	Maximum	Media	Standard deviation
Recycling	207	1	3	1,72	,537
Energy Consumption	207	1	3	1,21	,452
Water Consumption	207	1	3	1,22	,450
Transport and Environment	207	1	3	1,68	,636

 doi:10.20944/preprints202604.0643.v1

Responsible Consumption of Products	207	1	3	1,72	,554
Participation	207	1	3	1,70	,622
N valid (per list)	207				

3.5. Spearman's Correlation Between Dimensions of Environmental Attitudes and Environmental Behavior

According to the dimensions of environmental attitudes, they present positive and statistically significant relationships with the dimensions of environmental behavior (p = 0.000).

Behavioral attitude presents the highest correlations, especially with: recycling (ϱ = 0.455), water consumption (ϱ = 0.447) energy consumption (ϱ = 0.432)

The cognitive attitude shows moderate relationships in all dimensions.

The affective attitude presents weak correlations, being the dimension with the least influence.

In general, it is evident that the behavioral and cognitive dimensions have a greater impact on specific environmental behaviors. Table 5.

Table 5. Spearman's correlation between dimensions of environmental attitudes and environmental behavior.

Spearman's Rho		Recycling	Power consumption	Water consumption	Transportation and a half Environment	Responsible consumption	Participation
Attitude Cognitive	Correlation coefficient	.412**	.385**	.401**	.368**	.354**	.376**
	Sig. (bilateral)	.000	.000	.000	.000	.000	.000
	N	207	207	207	207	207	207
Attitude Affective	Correlation coefficient	.198**	.221**	.205**	.187**	.176**	.193**
	Sig. (bilateral)	.000	.000	.000	.000	.000	.000
	N	207	207	207	207	207	207
Attitude Behavioral	Correlation coefficient	.455**	.432**	.447**	.418**	.406**	.429**
	Sig. (bilateral)	.000	.000	.000	.000	.000	.000
	N	207	207	207	207	207	207

Source: Data collection instrument.

3.6. Spearman's Correlation Between Environmental Attitudes and Environmental Behavior

Favorable environmental attitudes predominantly present good environmental behavior (44.9%), while those with unfavorable attitudes are concentrated at a regular level (42.5%). On the other hand, students with unfavorable attitudes are all at the deficient level (2.4%).

Likewise, Spearman's correlation analysis shows a coefficient of ϱ = 0.438, evidencing a moderate and statistically significant positive relationship (p = 0.000) between the variables. This indicates that, as environmental attitudes improve, so does the environmental behavior of students Table 6.

 doi:10.20944/preprints202604.0643.v1

Table 6. Correlation between Environmental Attitudes and Environmental Behavior.

	Environmental performance							
Environmental Attitudes	**Good**	**%**	**Regular**	**%**	**Poor**	**%**	**Total**	**%**
Favorable	93	44.9%	0	0.0%	0	0.0%	93	44.9%
Unfavorable	21	10.1%	88	425%	0	0.0%	109	52.7%
Unfavorable	0	0.0%	0	0.0%	5	2.4%	5	2.4%
Total	114	55.1%	88	42.5%	5	2.4%	207	10.0%

	Environmental Attitudes	Environmental Behavior
Spearman's Rho		
Environmental Attitudes	1.000	0.438**
Sig. (bilateral)		0.000
N	207	207
Environmental Behavior	0.438**	1.000
Sig. (bilateral)	0.000	
N	207	207

Source: Data collection instrument.

4. Discussion

Promoting a defined environmental attitude will have an impact on appropriate environmental behaviour. In this research, results were obtained from the general data of university students, with a predominance of the age of 20 to 24 years with 46.3%, with the arithmetic mean ($\bar{X}$) being 20.56years, and a standard deviation(SD) of 2.875. Data that coincide with Perez(34) in his study students of 18 and 20 years of age participated. As for the gender, 79.7% female students predominated. Regarding marital status, the majority indicated that they are single 97.6%, with the second cycle of studies predominating 19.3%. Data that are consistent with the studies of Torres (35) where the majority (83.0%) identified as women, were single (92.9%).

The descriptive results show that the environmental attitudes of the students are predominantly characterized by an "unfavorable" attitude (52.7%), followed by a "favorable" attitude (44.9%) and a minimum proportion with "unfavorable" attitudes (2.4%). When analyzing by dimensions, it is observed that the cognitive attitude presents the most favorable mean (1.27) (75.8%), which indicates that students have a good level of knowledge and beliefs about environmental issues. In contrast, the mean behavioral attitude was less favorable (2.00) (79.2%), suggesting that although students are knowledgeable about environmental issues, their actual willingness to adopt pro-environmental behaviors is more limited. The affective attitude occupies an intermediate position (1.68) (61.4%), reflecting moderately favorable feelings and emotions towards the environment. These findings suggest that there is a disconnect between environmental knowledge and behavioral disposition, which could explain why general attitudes are not as favorable as might be expected, data that resembles those of Pulido [26] in the face of attitude and behavior, it is necessary to reflect on current production patterns and way of life in university students, and to reorient actions towards a model of sustainable development and respect for the environment.

The environmental behavior of students is predominantly evaluated as "good" (55.1%), although a considerable proportion shows "fair" behavior (42.5%) and only a small percentage presents "poor" behavior (2.4%). These data reaffirm what was expressed by Donmez [39], in his study he confirmed that environmental education has a significant effect on behavior, specifically in behaviors oriented to voluntary, profit, or normative objectives. Consequently, it was estimated that trained individuals would exhibit voluntary pro-environmental behavior 4.7 times more than untrained individuals.

When examining the specific dimensions, it is highlighted that behaviors related to energy (mean=1.21) and water (mean=1.22) consumption are the most favorable, suggesting that students have efficient practices in the use of these resources. On the other hand, the dimensions with the worst results are recycling (mean=1.72), responsible consumption of products (mean=1.72) and

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participation in environmental activities (mean=1.70), indicating areas of opportunity for improvement. Transport-related behavior (mean=1.68) also shows intermediate performance. These results reveal that, although students have good habits in the basic consumption of resources, they present greater difficulties in more complex practices such as recycling, responsible consumption and active participation in environmental initiatives. Data that are not consistent with the study by Ordoñez [40] that revealed a surprising scarcity of environmental behavior in university students of various professional careers, suggesting a "quasi-virgin" area of the subject for future research.

Spearman's correlation analysis demonstrated a moderately and statistically significant positive relationship between cognitive attitude and environmental behavior ($\rho = 0.433$, $p < 0.001$). This finding indicates that students with greater knowledge, beliefs, and awareness about environmental issues tend to exhibit better pro-environmental behaviors. The magnitude of the correlation suggests that approximately 18.7% of the variability in environmental behavior can be explained by cognitive attitude, confirming the specific hypothesis HA1. This result is particularly relevant because cognitive attitude was the dimension with the best scores in the study, which could be contributing significantly to the overall environmental behavior observed. The moderate relationship found also suggests that, although knowledge is important, there are other factors that influence environmental behavior, such as practical barriers, social norms, or available infrastructure. Data that bear some similarity to those found by Yusliza et [al41], in their findings, environmental commitment, environmental awareness and green lifestyle, and green self-efficacy positively influenced pro-environmental behavior, thus providing new insights into the existing literature on environmental sustainability. Likewise, Torres (42) states that individuals need to be sufficiently informed, motivated and convinced of the effectiveness of their actions so that they translate into sustainable behaviors. Paredes [43], in his study, establishes that universities that implement effective sustainability policies and practices tend to have students more committed to environmental protection.

Spearman's correlation revealed a weak but statistically significant positive relationship between affective attitude and environmental behavior ($\rho = 0.247$, $p < 0.001$). This result indicates that feelings, emotions, and emotional connections to the environment have a limited but real influence on students' pro-environmental behavior. The relatively low magnitude of the correlation suggests that only about 6.1% of the variability in environmental behavior can be explained by affective attitude, confirming the specific HA2 hypothesis, albeit with a weaker association than in the case of cognitive attitude. This finding could be explained by the fact that, although students may feel affectively connected to the environment, their actual behaviors are more influenced by practical factors, knowledge, or contextual barriers. The weak but significant relationship also suggests that educational interventions based solely on appealing to emotions could have a limited impact on environmental behavior change, these results are very consistent with Mkumbachi et al.[44], which found main results that revealed that most of the university students presented high environmental awareness and high ecological behavior. In addition, the study confirmed the significant relationship between variables. In other words, students who demonstrated greater environmental awareness also tended to show greater commitment to actions and behaviors that benefit the environment.

Spearman's correlation analysis showed a weak but statistically significant positive relationship between behavioral attitude and environmental behavior ($\rho = 0.204$, $p = 0.003$). This result indicates that students' stated willingness to adopt pro-environmental behaviors has a limited but real influence on their actual behaviors. The magnitude of the correlation suggests that approximately 4.2% of the variability in environmental behavior can be explained by behavioral attitude, confirming the specific HA3 hypothesis, albeit with the weakest association among all dimensions studied. This finding is particularly interesting because behavioral attitude was the dimension with the worst scores in the study, which could be reflecting a gap between behavioral intent and actual action. The weak relationship found suggests that, although students may express a willingness to behave in a pro-environmental manner, factors such as lack of opportunities, practical barriers or social influence could be limiting the translation of these intentions into concrete behaviors. Data that are not

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consistent with what was found by Sousa et al. [24], revealing in the results that the majority of the students have significant environmental knowledge, exhibit respectful attitudes towards the environment and demonstrate environmental awareness with the proper use of paper, energy consumption and recycling. Most university students are aware of protecting the environment and have good information on environmental issues.

Correlation analysis using Spearman's Rho coefficient showed a moderately and statistically significant positive relationship between environmental attitudes and environmental behavior (ρ = 0.438; $p < 0.01$). This value suggests that, as students have more favorable attitudes towards the environment, they tend to exhibit more responsible environmental behaviors. These data are consistent with Ordóñez [40] where his results showed a value of R=0.221 for the general attitude towards environmental conservation, findings that may be useful for the design of educational interventions that promote pro-environmental attitudes and behaviors in future health professionals.

5. Limitations of the Study

Although a validated national instrument was used in the department of Puno, in the highland region, it could be limiting to have applied it in the region of Ica, a department located on the coast of Peru. Sample size was calculated based on established data, but the use of convenience sampling may have limited the external validity and generalizability of the results.

These findings cannot be generalized to all university students in Peru or the world, but they could serve as a reference for comparison of future works that allow identifying the relationship between environmental attitudes and behaviors in university students

6. Conclusions

The result indicates that, as students' environmental attitudes become more favorable, their environmental behavior also tends to improve, although the relationship is not perfect.

The findings indicate that students with greater knowledge, beliefs, and awareness about environmental issues tend to exhibit better pro-environmental behaviors. This result indicates that feelings, emotions, and emotional connections to the environment have a limited but real influence on students' pro-environmental behavior.

This result indicates that the declared willingness of students to adopt pro-environmental behaviors has a limited influence, but it provides us with tools to strengthen educational and promotional actions in the student collective.

Author Contributions: For research articles with multiple authors, a short paragraph specifying their individual contributions should be included. The following statements should be used: "Conceptualization, LP; methodology, LP; UI software; LP, IU, PB, validation, LP, IU and KLL, PB; formal analysis, LP, IU, KLL, PB; research, resources, LP, IU, KLL, PB; data curation, LP, IU; writing: preparation of the original draft, LP, IU, KLL, PB; writing: revision and editing, LP, IU, PB, KLL; display, LP, IU, PB, KLL; supervision, LP; IU; LP project management; IU; acquisition of funds, LP, IU, KLL, PB. All authors have reviewed and accepted the final version of the manuscript to be published.

Funding: This research did not receive external funding.

Statement of the Ethics Committee: The following work was reviewed by: Research Ethics Committee CEI-UNICA-N026/09-2025 and complies with the ethical guidelines and procedures established in the Ethical Regulations for research involving human beings, animals and plants at the National University "San Luis Gonzaga", approved by Rectoral Resolution No. 1305-R-UNICA-2020 and with the current national regulations on research ethics. The project also complies with the international ethical principles contained in the Declaration of Helsinki and the CIOMS/WHO Guidelines, guaranteeing respect for human dignity, obtaining informed consent, protecting participants and, in the case of animal use, compliance with welfare and care provisions. In witness whereof, and for the corresponding purposes, the certificate is presented on the 22nd day of the month of September 2025.

 doi:10.20944/preprints202604.0643.v1

Informed Consent Statement: Informed consent was obtained from all study participants in writing.

Data Availability Statement: The original contributions presented in this study are contained in the article. If you have any additional questions, you can contact the corresponding author.

Public Participation Statement: Participants completed the Environmental Attitudes and Behaviors questionnaire in its entirety.

Guidelines and Standards Statement: This manuscript was written in the Chicago style and transcribed manually.

Use of artificial intelligence: The manuscript was initially written in Spanish. It used translation through Word format and then reviewed by an English linguist. .

Acknowledgments: To the Universidad Nacional San Luis Gonzaga, for providing facilities for the development of research to research professors. To the Office of the Vice-Rector for Research for its permanent motivation during this process. To our dear students for their support in this journey of collecting such valuable information that will allow us to provide solutions to problems in our region.

Conflicts of interest: The authors declare that they have no conflict of interest.".

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