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Environmental health education, a necessity in the professional training of early childhood educators

La educación para la salud ambiental, una necesidad en la formación profesional del educador de la primera infancia

Educação em saúde ambiental, uma necessidade na formação profissional de educadores da primeira infancia

Abstract

Introduction: early childhood educators must recognize the relationship between children's well-being and the quality of the environments in which they develop; therefore, environmental health education should be included in their professional training. **Objective:** to diagnose the presence of environmental health education in the professional training of early childhood educators at the University of Pinar del Río "Hermanos Saíz Montes de Oca". **Method:** a qualitative approach was used, integrating theoretical methods such as historical-logical analysis, analytical-synthetic reasoning, and modeling, together with empirical methods including document analysis, observation, and surveys, as well as descriptive statistical procedures. **Results:** it was found that the professional training process is insufficiently utilized to promote environmental health education, revealing shortcomings in both intra- and interdisciplinary approaches. **Conclusion:** the findings highlight the importance of considering environmental health education as a transformative framework to strengthen the comprehensive training of early childhood professionals. Therefore, existing limitations must be addressed, and the training process should be redesigned with a unified approach that balances the objectives of health education and environmental education.

Keywords: environmental education, health education, professional training, health, environmental health

Resumen

Introducción: el educador de la primera infancia debe reconocer la relación entre el bienestar de los niños, niñas y la calidad del ambiente en que se desarrollan, por lo que desde su formación profesional se debe incluir la educación para la salud ambiental.

Objetivo: diagnosticar la educación para la salud ambiental en la formación profesional del educador de la primera infancia en la Universidad de Pinar del Río "Hermanos Saíz Montes de Oca". **Método:** se empleó el enfoque cualitativo que armonizó métodos teóricos como el histórico lógico, analítico sintético y la modelación, con métodos empíricos análisis documental, observación, encuesta y los procedimientos de la estadística descriptiva. **Resultados:** se constató que es insuficiente el aprovechamiento del proceso de formación profesional para educar la salud ambiental, evidenciando carencias en enfoques intra e interdisciplinares. **Conclusión:** las valoraciones realizadas evidencian la importancia de considerar la educación para la salud ambiental como un planteamiento transformador para fortalecer la formación integral del profesional de la primera infancia. Por lo que se debe atender las limitaciones y proyectar el proceso de formación con un enfoque y unificador que equilibre los objetivos de educación para la salud y la educación ambiental.

Palabras clave: educación ambiental, educación para la salud, formación profesional, salud, salud ambiental

Resumo

Introdução: o educador da primeira infância deve reconhecer a relação entre o bem-estar das crianças e a qualidade do ambiente em que se desenvolvem; por isso, a educação para a saúde ambiental deve ser incorporada à sua formação profissional. **Objetivo:** diagnosticar a presença da educação para a saúde ambiental na formação profissional do educador da primeira infância na Universidade de Pinar del Río "Hermanos Saíz Montes de Oca". **Método:** utilizou-se uma abordagem qualitativa que articulou métodos teóricos, como o histórico-lógico, o analítico-sintético e a modelagem, com métodos empíricos, incluindo análise documental, observação, questionário e procedimentos da estatística descritiva. **Resultados:** constatou-se que o processo de formação profissional é insuficientemente aproveitado para promover a educação para a saúde ambiental, revelando carências em enfoques intra e interdisciplinares. **Conclusão:** as análises realizadas evidenciam a importância de considerar a educação para a saúde ambiental como uma perspectiva transformadora para fortalecer a formação integral do profissional da primeira infância. Assim, é necessário enfrentar as limitações existentes e projetar o processo formativo com uma abordagem unificadora que equilibre os objetivos da educação para a saúde e da educação ambiental.

Palavras-chave: educação ambiental, educação para a saúde, formação profissional, saúde, saúde ambiental

Introduction

Human history shows that health, education, and life itself are among the most valued assets. However, over the last decades, health has increasingly been shaped by biological, social, environmental, and technological factors, which has created new challenges for quality of life (Moreno Sánchez, 2022). In this context, there is a clear need for an integrated and collaborative approach that cuts across sectors and national boundaries.

The conceptual evolution of health reflects this requirement. The World Health Organization's idealized definition, although comprehensive, proved to be of limited practical applicability (OMS, 1978). It was subsequently reframed as a personal and ecological experience (Rodríguez Carvajal et al., 2022), culminating in the One Health systemic model (OMS, 2023), which calls for intersectoral action and resilience. This shift underscores that health cannot be separated from the surrounding environment, nor from collective action.

In this regard, Health Education (HE) is a key instrument. Borromeo (2025) conceptualizes it as training aimed at establishing healthy habits and lifestyles, with the purpose of fostering reflective individuals who are committed to both their own well-being and that of the community. Environmental health (EH) broadens the lens further by incorporating physical, chemical, biological, and emotional factors (OMS, 2023). Yet, because of its breadth, EH requires concrete indicators to become operational.

As Esteves Fajardo et al. (2023) emphasize, EH is not the responsibility of experts alone; protecting the environment also means protecting our well-being. Accordingly, UNESCO (2021) stresses that environmental stewardship is a collective mission that begins with education and helps inspire transformative communities (Kotaman et al., 2022; Aquije-Mansilla, 2025; Fang et al., 2023; Angueira Betancourt et al., 2024; Mukhlis et al., 2024).

Only through an inclusive, multisectoral, and multidisciplinary approach can progress be made toward a future in which EH is equitable and accessible to all. For this reason, educational systems play a critical role. The authors share this position, grounded in the need for people to possess the knowledge necessary to understand how their actions may affect the environment as well as individual health.

The discussion above further highlights the need for research, since educating EH among education professionals, particularly those working in early childhood, ensures the preparation of educators capable of identifying and addressing problems related to environmental health. At the same time, it enables them to recognize the relationship between children's well-being and the quality of the environments in which they develop. This, in turn, supports the creation of learning environments that promote physical and emotional health while strengthening responsibility for environmental care. Moreover, it supports collaboration from the education sector in health promotion efforts aimed at addressing major community-level problems.

In response to these demands, Cuba is implementing the Director Program for Promotion in Health Education within the National Education System, alongside

the plan for addressing climate change and the national strategy for environmental education (EE). These initiatives have been gradually incorporated into higher education to develop general knowledge and skills among students graduating from pedagogical programs.

Professional training (PT), understood as a complex process that extends beyond the mere transmission of knowledge, involves social, cultural, and psychological dimensions (Horruitiner Silva, 2020; Pino Calderón & Parra Vigo, 2021; Rodríguez Rodríguez et al., 2022; Pardo Ochoa & Vigoa Escobedo, 2023; Tina Hascher et al., 2021; Guevara Herrero et al., 2024). As noted by Hernández Cabrera et al. (2023) and Hernández Estrada et al. (2024), training integrates academic, investigative work-based, and extension components, enabling professionals to develop practical and reflective skills to address real-world problems. From this perspective, the holistic preparation of early childhood educators must include a strong environmental culture that supports sustainable development and promotes healthy lifestyles.

Prior research has addressed EE and HE within educational contexts (López et al., 2018; Carrasquel, 2023; Escobar-Castellanos et al., 2024). Based on the consulted sources, the study acknowledges the contributions of López Noroña (2025), who highlights the importance of environmental education and health education in the initial training of early childhood educators. Nevertheless, the proposed approaches show limitations. While research exists on EE and HE in isolation, the literature indicates a gap in frameworks that integrate them as a single, interdisciplinary process responsive to the needs of the professional profile.

Accordingly, the present study considers as a variable of interest environmental health education in the professional training of early childhood educators (EHEPTECE). This construct is defined operationally as:

The interdisciplinary pedagogical process that integrates the objectives and content of health education and environmental education during the initial training of early childhood educators. Structured across the instructive, educational, and developmental dimensions (Horruitiner, 2020), this process seeks to equip future professionals with the knowledge, skills, values, and attitudes required to promote healthy and sustainable environments, and to act as an agent of prevention and environmental health promotion within their professional practice context.

Based on the above, the objective of this article is to present a diagnostic assessment of environmental health education in the professional training of early childhood educators at the University of Pinar del Río “Hermanos Saíz Montes de Oca,” identifying the main gaps and regularities that characterize this process.

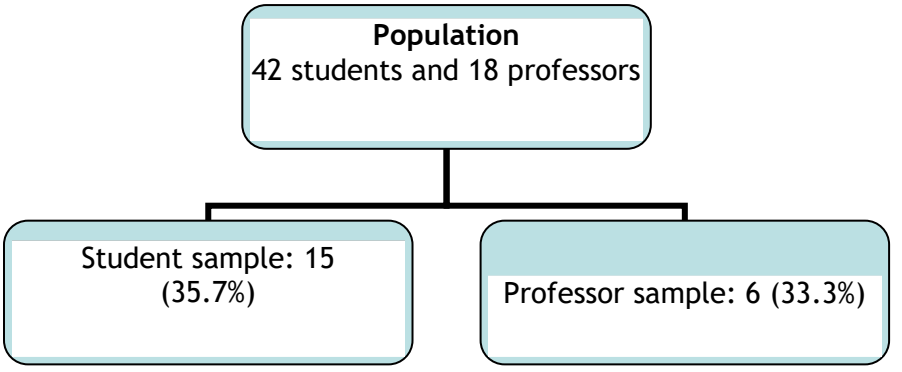
Methods and materials

The study was conducted at the University of Pinar del Río “Hermanos Saíz Montes de Oca,” within the Bachelor’s Degree in Early Childhood Education, over the period from September 2022 to July 2024.

The study population comprised 42 students and 18 professors from the Early Childhood Education Department. An intentional (purposeful) sample was selected: 15 students (35.7% of the student population) and 6 professors (33.3% of the professor population). Inclusion criteria were as follows: (1) being a first- or second-year student in the degree program, since these are the years in which training begins and where courses with strong potential for addressing environmental health content are taught; (2) being a professor who delivered teaching in those academic years; and (3) agreeing to participate voluntarily in the study. (Figure 1).

Figure 1

Population and sample



Source: Own elaboration.

As a general method, the study adopted a dialectical-materialist approach, enabling analysis of the research object from a scientific standpoint. This approach was used to examine the relationships established within the process of (EHEPTECE).

Several theoretical methods were used to ground the interdisciplinary approach to environmental health education in the training of the early childhood educator. Specifically, the following were employed: historical-logical method, to analyze the evolution of the relationship between health education (HE) and environmental education (EE); analytical-synthetic method, to conduct a rigorous examination of bibliographic sources and normative documents; and modeling, to represent the dimensions and indicators of the process under study.

Empirical-level methods:

A descriptive pedagogical study was carried out, grounded in a qualitative approach, with the aim of gaining an in-depth understanding of the educational dynamics involved in the process of (EHEPTECE).

Documentary analysis was applied to: study plans, course syllabi (programs), MES, MINED, and MINSAP regulations, methodological plans, course planning, the annual educational project, and institutional curricular strategies. This was done to identify opportunities for integrating environmental health (EH) within the professional training (PF) process. A guide with predefined categories was developed, including: (1) the presence of EE-related content; (2) the presence of

HE-related content; (3) the explicit articulation of the relationship between the two; and (4) methodological guidelines for their integrated approach.

Ten classroom observations were conducted in first- and second-year courses using a semi-structured observation guide. The guide recorded: (1) how content related to environmental health was addressed; (2) explicit references to the health–environment relationship; (3) practical activities proposed; and (4) student participation. Observations were conducted by two researchers to ensure reliability, and were validated through a pilot application followed by subsequent adjustments.

Two surveys were administered, one to students and one to professors. Both instruments were developed and validated using expert judgment (five specialists in education and health). The questionnaires included both closed-ended and open-ended items. The student questionnaire explored: knowledge of environmental health, perceptions regarding their training on the topic, lifestyle patterns, and willingness to promote environmental health. The professor questionnaire assessed: knowledge of environmental health, preparation to address the topic within their courses, the didactic strategies used, and perceptions of the curriculum. Qualitative data were organized into thematic matrices and coded according to the established dimensions.

Methodological triangulation was used to compare and contrast results from surveys, observations, and documents, thereby strengthening the study's internal validity. This technique allowed for validation of findings derived from multiple perspectives and enriched the analysis of the investigated phenomenon.

To study and transform this process, the research was contextualized around the three dimensions identified by Horruitiner (2020) for professional training in higher education:

Instructive dimension provides students with knowledge on environmental health so they can understand the interconnection between the environment and its influence on human health. Developing these skills better prepares graduates to create healthy environments in both the institution and the community, thereby improving job performance.

Educational dimension forms the professional as a social being who embodies values and knowledge related to environmental health, serving as a model through healthy lifestyle practices. This includes mastery of pedagogical resources for environmental prevention and health-related work with children and families. In addition, educators must be able to act upon communities, transforming and developing them.

Developmental dimension strengthens students' professional competencies and facilitates successful performance in the workplace. This perspective implies that, from the earliest stages of academic training, future professionals must acquire knowledge about environmental problems and understand their impact on everyday life. In this way, they are prepared to identify, intervene in, and prevent environmental factors that may affect community health while also promoting responsible environmental practices that encourage care for the planet and the construction of healthy spaces.

The operationalization of the variable was carried out using criteria from multiple international institutions. The study adopted the criteria proposed by Llivina Lavigne and Valdés Valdés (2021), as well as the approaches of the Ministerio de Ambiente and Ministerio de Salud Pública de Uruguay (2022) and Mena (2022). These sources consider environmental health indicators as tools that allow, with the highest possible precision, to determine the effects of climate change on health through sensitive and specific variables reflecting the burden of disease attributable to environmental factors. Furthermore, these indicators vary significantly across regions due to socioeconomic, cultural, and environmental conditions.

Integrating environmental health indicators into the training of early childhood professionals was essential to anticipate risks, adapt practices, and promote healthy habits. This, in turn, enabled educators to act as agents of prevention and transformation in favor of child well-being and sustainability.

In relation to the study objectives, the following indicators were measured:

Dimensions and indicators

- Instructive dimension:

✓ Knowledge of environmental health (EH).

✓ Knowledge of the interconnection between the environment and human health.

✓ Knowledge of regulatory documents governing actions related to health education (HE).

✓ Knowledge of the essential guidelines that structure work in the context of environmental education (EE).

- Educational dimension:

✓ Development of competencies oriented toward promoting environmental health.

✓ Ability to make decisions and adopt more sustainable practices.

✓ Development of knowledge for evaluating, intervening, regulating, and preventing environmental factors that affect health.

✓ Motivation to create health-promoting environments.

- Developmental dimension:

✓ Willingness to educate about environmental health during the professional training of early childhood educators.

✓ Integration of EE and HE programs into educational strategies across the knowledge system of different course.

✓ Operationalization of environmental health education in organizing the teaching–learning process.

✓ Incorporation of knowledge about environmental health into the course

assessment system.

- ✓ Guidance for activities aimed at developing environmental health education within the academic, work-based, research, and extension components.

Results and discussion

The implementation of the research methods described above facilitated the identification of fundamental relationships between the training of students in the Bachelor's Degree in Early Childhood Education and environmental health. In addition, the document analysis identified relevant theoretical gaps associated with this topic.

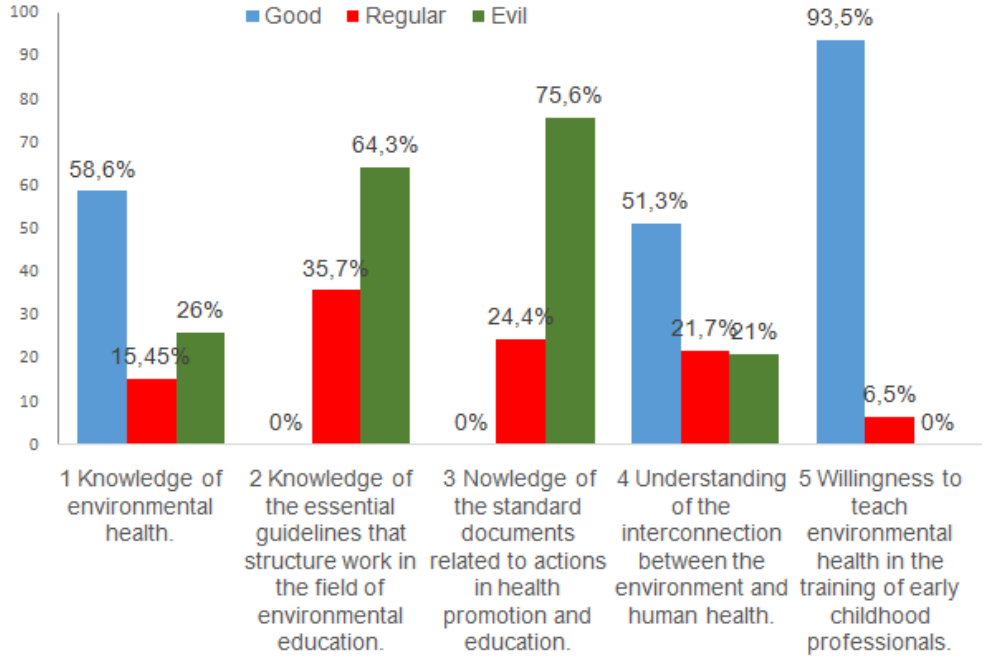
The analysis of normative documents revealed that, although directives exist to guide the treatment of health education and environmental education within the training of education professionals, these are addressed in a largely independent manner. The Director Program for Health Education Promotion establishes objectives and content for health education, but does not explicitly articulate its links with environmental problems. Similarly, the National Environmental Education Strategy and the Education Plan E address environmental education without establishing connections to health. At the level of annual curricular strategies, limitations were identified in defining objectives related to environmental health and in planning activities that integrate both dimensions. Taken together, these findings indicate that, at the normative level, the integration between EE and HE is not sufficiently developed.

Furthermore, the results showed that methodological indications and guidelines exist to govern the treatment of HE and EE in the training of early childhood professionals. However, the interdependence between these areas was not explicitly demonstrated, despite the fact that they share related objectives and comparable approaches. This limitation reduces opportunities for implementing environmental health education in early childhood educators' professional training (EHEPTECE). Integrating these two lines of work could strengthen professionals' capacity to make informed decisions that benefit both personal and collective health.

The survey administered to professors provided insight into their level of self-perceived preparedness to teach environmental health within the teaching process. The results showed that 64.30% of respondents placed themselves in the "poor" category of the scale, indicating that most recognize significant limitations in integrating environmental health into instruction. This finding aligns with Escobar-Castellanos et al. (2024), who reported that university faculty training in competencies for promoting environmental health remains incipient in the region. (Figure 2)

Figure 2

Professor survey

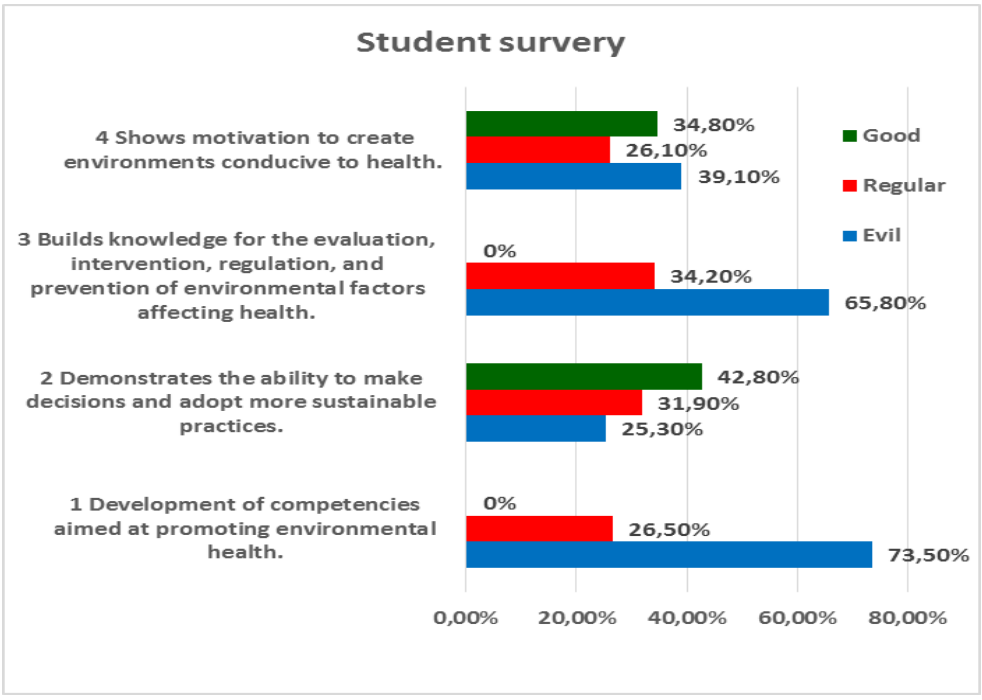


Source: Own elaboration.

The student survey revealed an insufficient development of knowledge related to environmental health (EH). In particular, deficits were observed in students' abilities to evaluate, intervene, regulate, and prevent environmental factors that affect health, as well as in their capacity to promote EH across different practice contexts. Specifically, 65.8% of the students were rated as "poor" in these areas. Consistently, 73.5% of respondents reported a prevalence of unhealthy lifestyle patterns and behaviors. These findings suggest that the training received to date has not been producing the expected outcomes in this domain (Figure3)

Figure 3

Student survey

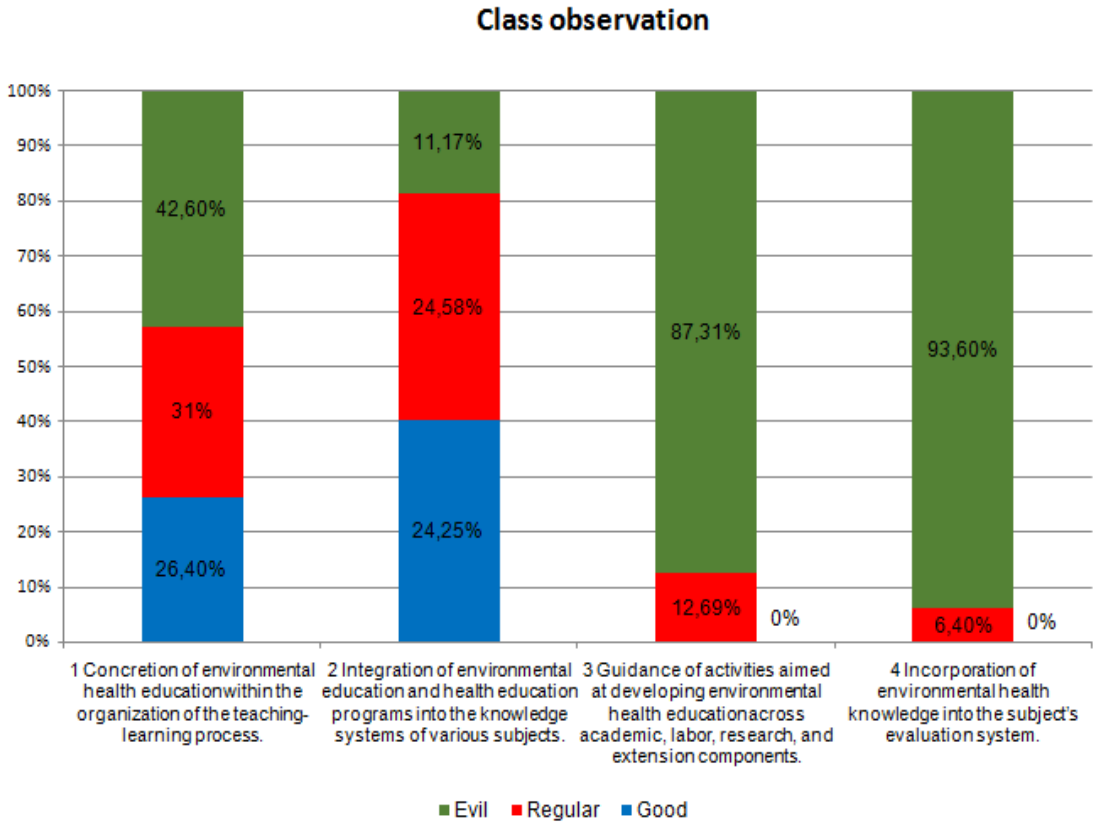


Source: Own elaboration.

Figure 4 shows that the way environmental health education is addressed through leveraging the knowledge system of courses in the curriculum is not sufficient. The promotion of the interdependence between human health and the environment was explicitly observed in only 20% of the classes. Moreover, students' perceptions of environmental risks associated with class content were absent in most cases. These results corroborate the self-perceptions reported by both students and professors, thereby triangulating the evidence.

Figure 4

Class observation results



Source: Own elaboration.

By integrating results across the different sources, the study identified the main regularities characterizing the environmental health education process in early childhood educator training (EHEPTECE):

In the instructive dimension, insufficient knowledge was found regarding topics related to environmental problems, the environment–health interconnection, and the normative documents that guide their treatment, among both students and professors.

In the educational dimension, gaps were evident in the intentional planning of tasks designed to develop preventive and promotive activities for EH, as well as limitations in fostering sustainable values and attitudes.

In the developmental dimension, a weak integration of environmental education (EE) and health education (HE) programs was identified within educational strategies, along with limited operationalization of these themes within the organization of the teaching–learning process. This constrains how these topics are addressed across the academic, work-based, research, and extension components.

The findings of this study provide an initial diagnosis of the state of

environmental health education in the training of early childhood educators at the University of Pinar del Río. The main results are discussed below in light of the specialized literature.

Document analysis showed that, although national programs and strategies exist to promote both EE and HE, these are not cohesively reflected in the programmatic guiding documents of the degree. This normative fragmentation constitutes an initial structural barrier to implementing an integrated environmental health approach. As Márquez Delgado et al. (2021) note, education for environmental health must be conceived as an interdisciplinary process that integrates knowledge, ethical principles, and personal dispositions. However, in the context analyzed, the present study indicates that such articulation is not explicitly embedded in the prescribed curriculum.

In this regard, the findings are consistent with Correa and Pérez (2022), who caution that the absence of an explicit HE strategy in teacher education programs limits the possibilities for an interdisciplinary approach. This limitation is further exacerbated in environmental health education, a field by definition requiring the convergence of multiple disciplines. In addition, the lack of clear methodological guidance for integrating EE and HE into year-by-year curricular strategies reduces the likelihood that students will develop a holistic understanding of the relationship between environment and health.

One of the most concerning findings of this study is the low level of self-perceived preparedness among professors to address environmental health in their teaching practice. This result is consistent with previous research reporting shortcomings in university teacher preparation for integrating transversal and emerging themes (Hernández Cabrera et al., 2023; Escobar-Castellanos et al., 2024; Ribet et al., 2025).

Insufficient teacher preparation has direct implications for students' training. As noted by Pino Calderón and Parra Vigo (2021), the professor is the primary mediator in constructing professional knowledge and attitudes. If teacher educators do not possess the necessary competencies to teach environmental health, they will be unlikely to transmit these competencies to their students. This finding helps explain, at least in part, the low performance observed among students in the instructive and educational dimensions.

First- and second-year students showed significant limitations in environmental health knowledge and in skills related to preventing environmental risks. This result is not entirely surprising given the limited curricular treatment of the topic and the insufficient level of teacher preparation. Nonetheless, it is particularly concerning because these students will soon be responsible for educating new generations about health care and environmental stewardship.

Authors such as Gonzaga Añazco et al. (2021) and Badillo Pazmiño et al. (2025) have emphasized that possessing knowledge about the environment does not necessarily translate into responsible behaviors; therefore, systematic and intentional educational action is required. The findings of this study suggest that, in the context examined, such systematic implementation is not present. The

prevalence of unhealthy lifestyle patterns among students and the lack of sustainable behaviors indicate that training has not yet produced a meaningful impact on the educational dimension.

Methodological triangulation confirmed the consistency of the findings. What normative documents do not prescribe, namely the integration of environmental education (EE) and health education (HE), is reflected in professors' limited preparedness. In turn, this is evidenced by students' low results and the scarce presence of the topic in observed classroom activities. This coherence across multiple sources strengthens the validity of the diagnosis and highlights the need to intervene at several levels: the normative level, the training level, and the didactic level.

The study's results have clear implications for educational practice. First, it is necessary to review the degree program's normative documents to explicitly establish the integration between EE and HE, incorporating environmental health as a transversal axis. Second, there is an urgent need to design professional development and continuing-education programs for faculty, enabling them to acquire the competencies required to address environmental health within their respective courses. Third, it is important to redesign the year-by-year curricular strategies so that systematic activities are included across the academic, work-based, research, and extension components, thereby fostering students' knowledge, skills, and attitudes toward environmental health.

As Mayet-Wilson et al. (2020) note, health promotion in the university setting must be a deeply educational and structured endeavor, coherently integrated into institutional dynamics. Environmental health cannot remain an implicit subject or one addressed in fragmented ways; it requires an explicit place in both the curriculum and teaching practice.

This study also has limitations. Although the sample size was intentional and justified, it prevents generalization of the results to other contexts, since this was a specific case study conducted at the University of Pinar del Río. Additionally, the cross-sectional nature of the design does not allow causal relationships to be established. The study provides a snapshot of the current state of the variables, but it cannot determine how they may evolve over time.

Based on these findings, several avenues for future work can be identified. One priority is the design, implementation, and evaluation of an intervention strategy aimed at promoting the integration of environmental health into the degree curriculum. A second line of work would involve comparative studies with other universities in the country or the region to determine whether this problem is shared more broadly.

Finally, it is promising to explore the potential of new technologies, particularly artificial intelligence (AI), to support environmental health education. Recent studies by Chiu et al. (2024) and Asensio Soto (2025) suggest that AI can help personalize learning, analyze complex environmental contexts, and develop innovative professional competencies. Investigating how AI-based tools could be used to design educational intervention simulations or to create teaching resources tailored to early childhood about environmental health would represent a significant

step toward modernizing the curriculum and responding to the challenges of the twenty-first century.

Conclusions

The historical analysis of environmental health education (EHE) within the preparation of education professionals makes it possible to identify theoretical and methodological references that have enriched teaching practice, as well as the development of educational practices related to health and the environment. However, it is evident that this approach has received limited attention within the field of educational sciences, reinforcing the need to deepen both its study and its implementation.

Moreover, the diagnosis conducted at the University of Pinar del Río regarding early childhood educators' training in environmental health revealed significant gaps: limited knowledge of environmental problems, constrained understanding of their relationship to human health, and deficiencies in planning actions that strengthen preventive and promotive competencies. The study also found weak articulation between environmental education and health education programs within educational strategies, alongside low operationalization of these topics in teaching and methodological work. This situation undermines their effective integration into the components of professional training.

This research focused specifically on the initial professional training of early childhood educators, which represents a limitation by excluding the dimension of continuing education and the analysis of its impact on professional practice. This aspect is essential for understanding how knowledge acquired regarding environmental health translates into concrete actions within educational settings, particularly in early childhood contexts, and may serve as a direction for future research.

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Declaration of author responsibility

Lizandra López Noroña: 1: Conceptualization, Data curation, Formal analysis, Research, Methodology, Resources, Software, Supervision, Validation/Verification, Visualization, Writing/original draft and Writing, review and editing.
Xiomara Morejón Carmona 2: Supervision, Validation/Verification, Visualization, Drafting/Original Draft, and Writing, Review and Editing.
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