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Environmental Education and Health Education in Primary Education: Teacher Perceptions Across Educational Levels (Kindergarten – Elementary School)

Fotios Mylonas

Department of Public and Community Health, University of West Attica, Athens, Greece

Abstract: This study examines Primary Education teachers' perceptions regarding the impact of Environmental Education (EE) and Health Education (HE) on students, and how these perceptions influence their teaching practices, with particular focus on differences between kindergarten and elementary school levels. Research indicates that EE is considered crucial for developing responsible environmental behaviors, while HE aims to improve hygiene habits and disease prevention. Teachers at both kindergarten and elementary levels play a pivotal role, as their personal beliefs and training significantly affect the implementation of EE and HE programs. Students participating in EE programs develop knowledge and positive attitudes toward nature, while the integration of health topics promotes healthier lifestyles. Teachers broadly recognize the importance of EE and HE in fostering environmental awareness and healthy habits from early childhood. In kindergarten settings, emphasis is placed on experiential learning activities, whereas elementary school programs focus on deepening knowledge and developing critical thinking skills. However, teachers report facing implementation challenges. This highlights the need for: (1) targeted program design, (2) enhanced teacher professional development, and (3) adequate infrastructure support."

Key words: environmental Education, Health Promotion, primary education, teacher perceptions, teaching practices

1. Introduction

EE and HE have been established as critical components of contemporary Primary Education in recent years, as societies and educational institutions confront emerging challenges related to climate change, public health risks, and the improvement of students' living conditions. According to the World Health Organization (WHO) [1] and UNESCO [2], the environment plays a pivotal role in children's psychosocial and physical development, underscoring the necessity for educational programs focused on health enhancement and environmental awareness cultivation.

Education systems worldwide carry the particularly vital mission of encouraging students to develop environmentally responsible behaviors while fostering positive environmental attitudes [3]. Furthermore, promoting child and adolescent health within school settings constitutes strategic action, as students spend a substantial portion of their time there [4]. Research indicates children and adolescents spend approximately 40% of their waking hours in classroom settings, thereby establishing schools as crucial environments for HE [5].

EE and HE represent closely interconnected domains that contribute significantly to:

- The development of environmental sensitivity
- The advancement of student health
- The formation of attitudes and values

Primary education teachers serve as fundamental agents in shaping children's initial conceptions about

Corresponding author: Fotios Mylonas, Ph.D.; research areas: environmental education & health education/promotion. E-mail: fmylonas@uniwa.gr.

environment and health matters. Consequently, their perceptions are critical for achieving these educational objectives. Teachers' environmental consciousness emerges as a significant parameter for strengthening environmental programs, such as school garden initiatives, with teachers reporting recognized benefits for students' cognitive and emotional development [6]. Similarly, HE programs implementation is substantially influenced by teachers' perceptions, their knowledge base, and potential barriers they encounter [7].

This comprehensive review pursues three key objectives:

1) To systematically analyze primary teachers' perceptions regarding the EE-HP relationship in student development
2) To examine perception differences across educational levels
3) To investigate how these perceptions influence teaching practices at each stage of Primary Education

Current scholarship reveals a notable research gap concerning teacher perceptions on these topics [8].

2. Theoretical Framework

2.1 EE and HE in Primary Education

2.1.1 EE in Primary Education

The problems of global environmental degradation and instability have led to calls for strengthening EE, as it has been proven that the best way to solve all these environmental problems is through educating societies. This education aims to ultimately create and maintain optimal and sustainable relationships between the environment and citizens, with the ultimate goal of increasing environmental awareness across all parts of society while simultaneously adopting different behaviors [9]. EE helps people understand how to live in harmony with the natural environment, act fairly towards each other, and make decisions based on care and concern for future generations [10].

EE is recognized as essential for promoting sustainability and developing environmental awareness in students from an early age. It refers to the process through which schools promote the development of skills and attitudes required for understanding and evaluating the complexity and changing relationships between humans, culture, and their natural environment [3]. The greatest challenge of EE is to create motivated, committed and conscious learners who can act in environmentally responsible ways. Therefore, understanding and developing children's environmental consciousness is crucial for promoting sustainability and combating environmental degradation [11].

According to Teksoz, Sahin & Ertepinar [12], EE would be better starting at preschool age and continuing throughout the education period. In Greece, EE is provided by the formal education system [13], with Primary Education consisting of kindergarten (children aged 4 and 5) and elementary school (children aged 6 to 12) [14].

In European education systems, formal EE is taught either as an interdisciplinary subject, as part of a compulsory subject area, or as a compulsory course. It is observed that in countries where EE is provided as a separate subject, it is also taught in another way, most often integrated into other school subjects. In France, Belgium, Finland, Spain and Greece, EE is a compulsory subject. In Montenegro, Croatia, Russia, Bulgaria, Czech Republic, United Kingdom, Portugal, Luxembourg, Ireland, France, Belgium, Serbia, Bosnia-Herzegovina, North Macedonia, Albania, Belarus, Slovakia, Poland, Sweden, Netherlands, Italy, Greece, Spain and Belgium, EE is part of various school subjects. In Germany, Finland, Austria and Denmark, EE is taught as an interdisciplinary subject [15].

2.1.2 HE in Primary Education

However, the primary role of schools extends beyond education and learning to include the promotion of health and development for students,

their families, and teachers [16]. The term "Health Promotion" (HP) refers to "the processes through which individuals become capable of increasing control over and improving their health" [17]. According to Weare [18], HE and HP are closely interconnected. HP relies on people's active participation to facilitate change, while HE serves as the tool for this process. The relationship between HE and HP could be expressed by the formula: HP = HE × "Healthy" Public Policy.

Globally, schools are recognized as crucial settings for HP and HE [19-20]. Thus, it becomes evident that the role of HP, and particularly HE within the school context, is not only important but essential [21]. The implementation of HE programs in schools leads to improvements in student well-being and overall health [22-23]. HE programs positively impact not only students but also schools and their interactions. They also beneficially affect social relationships by enhancing motivation, increasing satisfaction, supporting personal development, fostering positive attitudes, building knowledge and skills, and influencing health-related issues [24-25].

The implementation of HP programs varies according to each country's educational system. In Germany, each federal state follows its own strategy; in Poland, there is a national framework and curriculum; but in most countries, HP is incorporated into other subjects rather than being a standalone course [26].

In Greece, HE programs are implemented by teachers alongside thematic units such as EE [27]. Meanwhile, research conducted in Cyprus and Greece has highlighted the significance of nutrition education and physical exercise instruction in Primary Education [28].

2.2 Impact of EE and HE on Students

The integration of environmental and health topics in Primary Education has been shown to enhance students' knowledge in these areas. Research demonstrates that students who participated in EE programs showed significantly greater improvement in understanding recycling and environmental protection compared to those not exposed to such activities [28-29]. Furthermore, multiple studies emphasize that incorporating environmental themes in school activities can increase student engagement, strengthen environmental knowledge [30-31], and foster pro-environmental behaviors [32].

According to Nikolaidou & Ioannou [28], integrating environmental issues in elementary school curricula encourages students to develop positive attitudes toward environmental protection. Generally, exposure to natural environments before age twelve significantly contributes to healthy development, well-being, and the cultivation of environmental values [8, 33]. Additionally, collaborative learning during EE proves particularly effective, offering multiple benefits: it enhances knowledge acquisition, respect for multiculturalism, self-esteem, sense of shared responsibility, and peer support [34-35].

Research confirms that nature-based education programs effectively increase environmental sensitivity and awareness, as knowledge alone proves insufficient for changing human behavior [11]. Studies show elementary students' environmental behavior remains independent of their environmental knowledge, with emotional sensitivity and connection to nature being more significant behavioral determinants — factors that may conversely influence their environmental knowledge [9]. Otto & Pensini's [36] research revealed strong correlations between students' environmental knowledge and daily practices; for instance, students receiving targeted EE tended to recycle more and avoid plastic use.

Moreover, connecting with nature positively influences learning across diverse subjects including science, mathematics, agriculture, ecology, geography, art, and drama, while developing collaboration and communication skills [37]. School gardens exemplify this interdisciplinary potential, integrating not just

plant science but also history, mathematics, poetry, economics, nutrition, and scientific fields [6].

Similarly, students educated about nutrition and exercise demonstrated better understanding of unhealthy lifestyle consequences [28]. Children receiving nutrition education prove more likely to apply this knowledge daily [38]. Generally, health awareness initiatives can establish lifelong healthy attitudes [39-41].

Topping & Buchs' [29] study highlights that children in environmental programs develop deeper understanding of connections between personal health and broader environmental systems. Collectively, research on EE and HE impacts demonstrates significant improvements in student attitudes and knowledge. For example, Liefländer et al. [42] found EE participants showed increased interest in environmental protection and healthier habits.

Chawla [43] proved that students participating in recycling and school garden programs developed long-term environmental responsibility. Early cultivation of knowledge, attitudes, values, skills, and awareness establishes foundations for environmentally conscious citizens [44-45].

Recent studies like Mertens et al. [46] show that children taught health and environmental topics tend to develop better habits — increased fruit/vegetable consumption and preventive measures (e.g., mask-wearing). UNICEF [47] confirms that school programs combining health and EE increase adoption of healthy habits.

School gardens exemplify this synergy: by growing produce, children gain nutritional knowledge and increase fruit/vegetable consumption, establishing lifelong healthy eating patterns [6, 48]. This impacts prevention/delay of chronic diseases and addresses childhood obesity — a major public health issue in Greece and western societies. Additionally, outdoor spaces enhance youth mental health while supporting emotional and cognitive development [6].

Research indicates EE/HE participants better recognize how personal choices affect environment and health [31, 46]. Crucially, this enhanced awareness leads to lasting behavioral changes [46], confirming the transformative potential of integrated EE and HE approaches in primary education.

2.3 The Role of Teachers

Humans can benefit from their relationship with nature, and vice versa, with this connection needing to be established from an individual's earliest life stages. Thus, integrating nature-based activities in Primary Education is crucial, where teachers play a pivotal role — their personal perceptions influence this process both in implementation and evaluation [8]. Teachers' understanding of environmental issues and their instructional approaches are shaped by multiple factors including personal experiences, educational training, and cultural backgrounds [49].

Teachers serve as role models for students, and their attitudes significantly impact EE effectiveness. Research by Skanavis et al. [10] demonstrated that teachers with greater knowledge and positive attitudes toward EE are more capable of transmitting values and knowledge to students, strengthening environmental awareness and promoting sustainable behaviors. These teachers also show greater success in implementing environmental programs.

Teachers act as critical mediators in children's relationship with nature, exerting substantial influence on their behaviors and attitudes. As the primary agents in fostering students' environmental perspectives, teachers guide and organize the entire process of ecological knowledge acquisition and habit formation. Through their actions, they directly influence children's personality development in school settings, necessitating their active organization of both curricular and extracurricular environmental activities [15].

Children frequently demonstrate interest and concern about environmental issues, meaning

supportive administrators and teachers who implement activities like gardening through student enthusiasm rather than authoritarian approaches contribute decisively to program success [37]. Studies generally confirm that teachers' positive attitudes toward EE lead to more successful school integration [50].

Teachers equally play a vital role in HE, as their direct access to large student populations enables broad-scale HP and prevention efforts [51]. Schools represent children's primary source of formal knowledge and, after families, the most influential factor shaping children's dietary behaviors. Teachers thus become the most significant agents for implementing nutrition education, while emphasizing the need for awareness-raising to promote healthy eating in schools [52].

Elementary schools and kindergartens can substantially influence children's health behaviors during this formative habit-development stage, confirming teachers' critical role in early childhood development [53]. Teachers function as positive health role models through both practice and appearance, creating conditions for lasting health impacts, where their informal guidance proves equally important as formal instruction [51].

HE demands different teacher competencies, requiring not only content knowledge but also pedagogical skills. Studies reveal gaps in teachers' basic HE knowledge and program design capabilities [54-56]. Simultaneously, school HE programs depend heavily on teachers' knowledge, attitudes, and behaviors [21].

While teachers bear responsibility for providing food-related information and rules while modelling appropriate behaviors [57-58], most countries show teachers inadequately informed about their HP roles, with schools generally prioritizing HE poorly [59].

3. Review Mythology

3.1 Study Selection & Bias Risk Assessment

For this systematic review, we selected peer-reviewed articles published within the last 15 years through searches in PubMed, Scopus, and Google Scholar. The search strategy employed keywords including:

- "teacher perceptions on environment and health"
- "education in Primary Education"
- "impact on student development"

Inclusion criteria were:

1) Peer-reviewed journal articles
2) Relevance to EE and HE in Primary Education contexts
3) Focus on impacts of teacher perceptions
4) Studies employing quantitative, qualitative, or mixed methods

Bias risk was assessed using the 27 PRISMA 2020 criteria [60], focusing on:

- Sample representativeness
- Methodological transparency
- Validity of analytical tools

3.2 Methodological Examination

3.2.1 Quantitative Approaches

The study by Liefländer et al. [31] utilized questionnaires to measure changes in student knowledge and attitudes, demonstrating that intensive EE programs significantly improved environmental and health literacy. Similar objective quantitative improvements were documented by Ernst & Theimer [61] and Boeve-de Pauw & Van Petegem [30].

3.2.2 Qualitative Approaches

Wright & Parsons [62] conducted teacher/student interviews, revealing how experiential activities (e.g., school gardening) shape pro-sustainability attitudes and nutritional appreciation.

3.2.3 Mixed-Methods

Topping & Buchs [29] combined:

- Quantitative knowledge tests
- Qualitative teacher interviews

Their integrated approach provided comprehensive insights into program impacts, showing mixed methods yield richer evaluation data than single-method designs.

4. Results and Discussion

4.1 Common Perceptions

Studies show that both primary and preschool teachers recognize the benefits of implementing nature-based activities for their students' physical and mental health [8, 63, 64].

Additionally, in a survey by Beauchamp et al. [65], preschool and primary teachers noted that outdoor spaces promote physical activity, foster environmental awareness in children, and enhance their enjoyment of nature. In another study by Plaka & Skanavis [6], teachers reported that students who participated in gardening activities showed improvements in socialization, critical thinking, environmental consciousness, emotional balance, and overall well-being.

Preschool teachers in the study by Murakami, Su-Russell & Manfra [66] also acknowledged the cognitive, social, physical, and emotional benefits of school gardening for children, emphasizing its contribution to developmental experiences and the cultivation of self-determination skills. They also highlighted the role of school gardens in promoting learning, health, and children's connection with nature [67].

A study on teachers' views regarding HP in Spanish schools found that they considered HE to be more effective when parents, health professionals, and public institutions were involved [68]. Thus, students' knowledge, abilities, and skills in health-related matters should be supported and reinforced not only by schools but also by families and local communities [69-70].

4.2 Differences in Perceptions & Teaching Practices

The data collected from preschool and primary school teachers reveal significant differences in their approaches to these topics. In Ernst's [71] study on teachers' perceptions of EE, primary school teachers considered EE essential for developing responsible citizens. Preschool teachers, on the other hand, focused more on experiential and playful approaches [72].

Preschool teachers believe that children of the age lack the maturity for complex concepts [28] and are not yet ready to grasp intricate topics [73]. As a result, they prefer hands-on activities (e.g., hygiene practices, sorting natural materials) [28] and focus on simple, practical tasks such as observing nature and food hygiene [73]. In contrast, primary school teachers find it more effective to engage students in structured discussions and applications (e.g., climate change and recycling) to develop critical thinking [61-62].

Nikolaidou & Ioannou [28] noted that preschool teachers tend to favor more creative and playful teaching methods, such as storytelling and art-based activities. Primary school teachers, however, lean toward more systematic approaches, incorporating scientific data and projects.

To foster positive attitudes toward the environment, preschool teachers focus on simple, everyday activities like observing animals or planting seeds [73], while primary teachers emphasize knowledge and skill-building [61].

This issue has also been highlighted by Thorn [74], who argues that preschool teachers tend to limit their activities to guided experiences and rarely engage in academic discussions about environmental or health impacts. Primary school teachers, however, place greater emphasis on imparting knowledge about the environment and health, as children at this age are more capable of understanding scientific concepts and participating in discussions [28].

According to a study by Cutter-Mackenzie and Edwards [73], preschool teachers stated that they prefer activities that promote environmental friendliness, such as caring for plants or visiting parks. Though simple, these activities help children develop an initial environmental awareness and emotional connection with nature. Primary teachers, on the other hand, tend to integrate environmental and health topics into daily teaching through cross-curricular programs, often

covering recycling, sustainable development, and HE [28].

4.3 Challenges and Obstacles

Research by Theodoulou et al. [75] found that teachers are highly aware of the planet's challenges and exhibit positive environmental attitudes. However, studies indicate that teachers express concerns about fully integrating these topics due to a lack of infrastructure and existing academic demands [76]. Additionally, national curricula often lack flexible structures, making it difficult to incorporate sustainability topics [77].

A study by Skanavis et al. [10] showed that both primary and preschool teachers were well-informed about environmental issues. While they recognized the benefits of children's interaction with nature, they also emphasized the need for support from schools, parents, volunteers, and adequate infrastructure [65].

The main obstacles teachers face include:

- Insufficient training in environmental and health topics [49],
- Limited time within the school schedule [76],
- Inadequate teaching materials or tailored guidelines [77].

These challenges were further confirmed by Burnett & Gordon's [78] study, which found that only 35% of surveyed teachers felt adequately prepared to teach environmental and health-related subjects. In many cases, EE is not sufficiently integrated into daily school activities, as teachers frequently cite lack of resources or curriculum pressure as barriers to implementing environmental initiatives [74].

Additionally, many preschool teachers reported that time constraints and curriculum demand make it difficult to incorporate more environmental topics into daily teaching [79]. Research also highlights that challenges stem from lack of support (professional development or teaching materials) and the complexity of the curriculum [80].

Plaka & Skanavis [6] study showed that while teachers recognize that school gardening enhances environmental knowledge and awareness, they believe its implementation in the Greek educational system is feasible only if financial constraints and proper training are addressed. Similar concerns were raised in Greer et al.'s [81] study, where teachers emphasized insufficient resources and the frequent incompatibility of such interventions with the multicultural characteristics of students. They also stressed the importance of aligning school gardens with both the school curriculum and the local community.

Preschool teachers acknowledge the beneficial impact of school gardens on children but express concerns about implementation challenges, including:

- Personal beliefs on the subject,
- Lack of administrative support,
- Limited teaching time,
- Insufficient knowledge,
- Financial constraints,
- Staff shortages [67].

5. Conclusions & Recommendations

The literature review reveals that primary and preschool teachers play a crucial role in promoting EE and HE in schools. They fully recognize the positive impact of such programs on children's development, particularly in shaping their knowledge, attitudes, and values.

Key differences were observed between educational levels:

- Preschool teachers tend to use play-based approaches, focusing on basic environmental awareness and emotional connection with nature.
- Primary teachers employ more structured methods, incorporating interdisciplinary approaches and scientific knowledge.

However, teachers face significant barriers, including:

- Inadequate school facilities and lack of funding [6],
- Time constraints within the curriculum [76],
- Low confidence in teaching environmental topics due to insufficient training [78].

To address these challenges, the following measures are essential:

- Teacher Training: Implement specialized workshops to enhance teachers' skills in EE and HE.
- Curriculum Adaptation: Introduce flexibility in national curricula to better integrate sustainability topics.
- Resource Development: Provide tailored educational materials and funding for school initiatives (e.g., school gardens).
- Infrastructure Support: Invest in outdoor learning spaces and eco-friendly school environments.
- Community & Parental Involvement: Strengthen partnerships with local communities and parents to reinforce learning beyond the classroom.
- By addressing these areas, schools can more effectively foster environmental literacy, critical thinking, and sustainable behaviors in students, preparing them to become responsible future citizens.

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