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Review Paper

Integration of Outdoor Education in Health Education Curriculum: A Systematic Review of Teaching Models and Strategies

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Abstract: Outdoor education is well recognized, but researchers have not developed sufficient scientific analysis regarding successful teaching approaches and strategies that merge outdoor learning. The review addresses the knowledge gap through research on current teaching models, as well as their educational effects on students and the difficulties encountered during implementation. A systematic review of 37 peer-reviewed articles (2021–2025) was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The review analyzes three major concepts, which include experiential learning and adventure-based pedagogy and nature-immersive activities. The findings emphasize that experiential learning, adventure-based pedagogy, and nature-immersive activities play a crucial role in improving health literacy, critical thinking, student engagement, and physical well-being while also promoting environmental awareness and social responsibility. The widespread adoption faces barriers because it encounters curriculum integration issues. Hence, teachers need better training, as well as safety and logistical options. Educational institutions require complete outdoor-based health education curricula and teacher training programs, together with institutional support to achieve the best outcomes. Addressing these barriers could allow outdoor education to evolve from a supplementary strategy into a core component of modern health education and inspire innovative, inclusive, and sustainable teaching practices worldwide for future generations for all learners.

Keywords: Outdoor education; health education; experiential learning; teaching model; pedagogical strategies; curriculum integration

Introduction

The educational system today embraces a complete learning model that focuses on practical engagement between subjects and student involvement across disciplines. This educational environment supports outdoor education as a teaching method to deliver experiences that boost cognitive learning while supporting emotional health and promoting physical wellness (Quay et al., 2020). The combination of outdoor learning in health education leads to better health literacy while promoting physical activity and raising environmental consciousness, according to Rickinson et al. (2022). The field needs a systematic review to combine current knowledge about outdoor education in health curricula because its implementation remains irregular and unestablished. However, no prior systematic review has comprehensively synthesized teaching models and

pedagogical strategies that integrate outdoor learning specifically within the context of health education. This review uniquely contributes by identifying core frameworks and providing evidence-based insights into implementation barriers and educational impacts, thereby addressing a critical void in the literature. Researchers have confirmed the benefits of outdoor health education, although they have not developed established methods to incorporate it into formal curricula (Beames et al., 2012).

The effectiveness of experiential learning education depends on students experiencing things firsthand while thinking about their applications as outlined in Kolb's Experiential Learning Theory (1984), thereby making outdoor learning an outstanding health instruction method (Chiva-Bartoll et al., 2020). The theory explains that students learn best through direct experiences followed by reflection and conceptualizing and then implementing their knowledge. The application of experiential learning to health education enables students to participate in actual health activities outside the classroom, such as physical education outdoors and school gardening and community health projects which deepen their theoretical knowledge while building practical abilities (Bentsen & Jensen, 2022) The Social Constructivist Theory developed by Vygotsky in 1934 demonstrates how students learn best through peer collaboration with guided discovery methods that match outdoor learning principles (Thorburn & Marshall, 2021). New research indicates outdoor education in health curricula creates long-term health conduct while developing students' social responsibility and resilience thus becoming fundamental for present-day teaching (Gough, 2020). Chawla (2020) discovered robust links between nature-based learning that led students to show improved psychological well-being and reduced their stress levels and enhanced their self-regulation and social competence.

Several structural along with logistical obstacles prevent effective implementation of outdoor-based health education programs. Research findings show that outdoor-based health education remains limited in its expansion because current curricula do not match and teachers lack proper training and feel insecure for their students' safety along with existing policy limitations (Rickinson & Hunt, 2023). The integration of health education through outdoor learning remains fragmented because there are no standardized pedagogical models although some schools successfully teach environmental studies and physical education outdoors (Waite et al., 2022). Research to date investigates the general advantages of outdoor education yet it does not provide defined teaching strategies or health education learning outcomes (Mannion & Lynch, 2021). A structured analysis of existing research must be carried out to both identify effective practices and evaluate their effectiveness and develop scalable implementation frameworks.

The success of outdoor education depends on three main factors: what students represent, their previous experience with nature and their preferred methods of learning. The reviewed studies demonstrate that urban-based students struggle more than their rural peers when learning nature-based health concepts so educational methods need adaptation (Hinds & Sparks, 2020). The lack of standardization in outdoor education poses a challenge for assessing learning outcomes because different schools and countries cannot easily demonstrate consistent educational results according to Dillon et al. (2022). The existing disparities emphasize the requirement for organized teaching models able to adjust to various student learning needs. Research findings now show that males and females exhibit different patterns of interaction with outdoor learning environments. Boys participate more intensively in physically demanding activities that include survival skills and adventure-based learning according to Coates and Pimlott-Wilson (2019). Girls participate more actively in reflective and inquiry-based outdoor health projects compared to their male counterparts.

These differences may be influenced by cultural expectations and schooling practices across regions, where gender norms shape participation styles. In many Asian educational contexts, for example, girls are often encouraged to engage in more introspective and academically oriented tasks, while boys are supported in physical or exploratory activities. This highlights the need for culturally responsive outdoor learning strategies that are inclusive and sensitive to local values. The research indicates teachers must use specific instructional approaches to achieve maximum learning potential since current curriculum design strategies fail to address this need. The preparedness of teachers represents a critical concern. Bølling et al. (2019) reported that educators demonstrate health lessons outdoors with confidence in only 34 percent of cases because of insufficient training and uncertainties about teaching methods. The integration of outdoor instruction with

national curriculum standards presents challenges to teachers who deliver health-based outdoor learning in ways that are split and irregular, according to Gray and Birrell (2021).

Outdoor education implementation struggles with infrastructure restrictions which combine with logistical barriers. Urban schools encounter challenges in obtaining access to green spaces, thus making it harder to implement nature-based learning in their health curriculum, according to Fagerstam and Samuelsson, (2020). McArdle et al. (2023) explained that outdoor learning activities create security hazards and administrative challenges for students enrolled in highly populated schools. Two essential elements are needed to resolve these issues: policy reforms, increased investments in outdoor facilities, and adaptable educational programs that can work in different educational environments. Additional research is needed to develop standardized, evidence-based health education models for different educational environments because of the growing evidence of outdoor learning.

According to Prince (2021), including outdoor learning in official health education standards developed by curriculum developers would enhance policy backing and improve teaching methods. The authors support the implementation of hybrid learning models that integrate outdoor instructional elements with digital resources to create accessible programs that boost student participation rates, according to Waite et al. (2021). Long-term research needs to monitor students after their health education program to assess changes in their wellness choices over time. Cross-cultural research needs to evaluate outdoor learning effectiveness in health education because it determines how socio-economic factors and regional characteristics impact its success, according to O'Brien and Murray (2020). The development of fair outdoor learning policy frameworks for all students requires research to provide needed information.

A systematic review evaluates outdoor-based health education teaching models and strategies by conducting a systematic analysis. Consequently, it classifies the process despite existing challenges and opportunities. Specifically, this study aims to:

i. Identify the predominant teaching models and strategies used in outdoor health education.
ii. Assess the impact of these approaches on student learning, health literacy, and well-being.
iii. Examine the key barriers and challenges in implementing outdoor education within health curricula.

This review addresses key research questions which establish vital information for education professionals and policy makers and curriculum developers to improve the success and longevity of outdoor health education.

Methodology

1. Identification

Three major phases composed the systematic review approach used for publication selection in this research. The first step entailed performing thorough keyword identification with additional synonym searches conducted through thesauri, dictionaries, encyclopedias, and previously published research. The researchers built search strings methodically which they executed successfully within both the Scopus and Web of Science (WoS) databases (refer to Table 1 for data). During this preliminary phase, a total of 809 publications were retrieved from these databases, marking the initial dataset for further screening and analysis.

Table 1. The search string

Scopus	TITLE-ABS-KEY(("outdoor education" OR "experiential learning" OR "nature-based learning") AND ("health education" OR "health curriculum" OR "health literacy") AND ("teaching models" OR "pedagogical strategies" OR "active learning")) AND (LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2024) OR LIMIT-TO (PUBYEAR, 2025)) AND (LIMIT-TO (SUBJAREA, "SOCI")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (OA, "all"))
WoS	TS= (outdoor education OR experiential learning OR nature-based learning AND health curriculum AND teaching models)) AND TS=("outdoor education" OR "experiential learning") AND ("health education" OR "health curriculum") AND ("teaching models" OR "pedagogical strategies"

2. Screening

Throughout the screening phase, research items were evaluated for relevance to the study's objective of integrating outdoor education into health education curricula. This phase involved a thorough assessment to ensure the selected studies aligned with effective teaching models and strategies in primary health education. Consequently, duplicate records were systematically identified and removed. Initially, 679 publications were excluded in the first round due to irrelevance. The subsequent phase involved reviewing 133 papers using predefined inclusion and exclusion criteria (see Table 2). Two reviewers independently screened the titles, abstracts, and full texts to ensure alignment with the inclusion criteria. Any discrepancies were discussed and resolved through consensus to maintain consistency and reliability in the study selection process. The selection prioritized empirical research while omitting reviews, meta-syntheses, meta-analyses, books, book series, chapters, and conference proceedings not covered in the latest study. Additionally, only English-language publications from 2021 to 2025 were considered. In total, 37 additional studies were eliminated due to duplication, ensuring a refined dataset for analysis.

Table 2. The selection criterion is searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2021 – 2025	< 2021
Literature type	Peer-reviewed journal articles	Conference, Book, Review
Publication Stage	Final	In Press
Subject	Social Science	Others

3. Eligibility

In the eligibility assessment phase, a total of 131 articles were compiled for further evaluation. At this stage, the titles and core content of each article were carefully reviewed to ensure they met the inclusion criteria and aligned with the study's research objectives. The study excluded 96 articles because they fell outside the research scope and had minor titles, irrelevant abstracts and inaccessible full-text evidence. The review process ended with 37 articles suitable for analysis.

4. Data Abstraction and Analysis

This Systematic Literature Review (SLR) performed an integrative analysis of research designs which combined qualitative and quantitative and mixed methods studies regarding outdoor and environmental education and health and medical education, and community-based experiential learning. The analytical process delivered a complete understanding of experiential learning impacts through different educational settings. The data collection phase included a review of 37 peer-reviewed articles that selected information which supported the research objectives of this study. The chosen articles described experiential learning methods which develop cognitive abilities as well as social-emotional competencies and connect students to their communities and the environment. After data collection, the authors conducted systematic organizing of results into three main categories, which included experiential learning in outdoor and environmental education and innovative pedagogies and applied learning in health, medical, and higher education and community-based and social learning through experiential approaches. Thematic analysis was conducted using an inductive coding approach. Each article was thoroughly examined to identify recurring patterns and conceptually relevant themes. Codes were organized into categories and refined through iterative discussions among the research team to ensure consistency. Any differences in theme interpretation were resolved through researcher triangulation and expert validation to enhance the credibility of the findings. The researchers collaborated intensively to maintain uniformity in theme development while maintaining a detailed analysis documentation system from start to finish. The research team solved all thematic analysis discrepancies by reaching consensus through group discussions.

Two experts reviewed the identified themes to validate their validity and reliability. The first expert specialized in outdoor education, while the second expert specialized in public health engagement and participatory research. Two experts examined the clarity and relevance of the themes and sub-themes and

validated their connection to the research goals. Correspondingly, the expert review process helped refine the themes to reflect the complexities and nuances of experiential learning across multiple educational settings. This integrative approach provided a robust framework for understanding the transformative impact of experiential learning and identified key areas for future research, particularly in enhancing inclusivity, technology integration, and long-term community engagement.

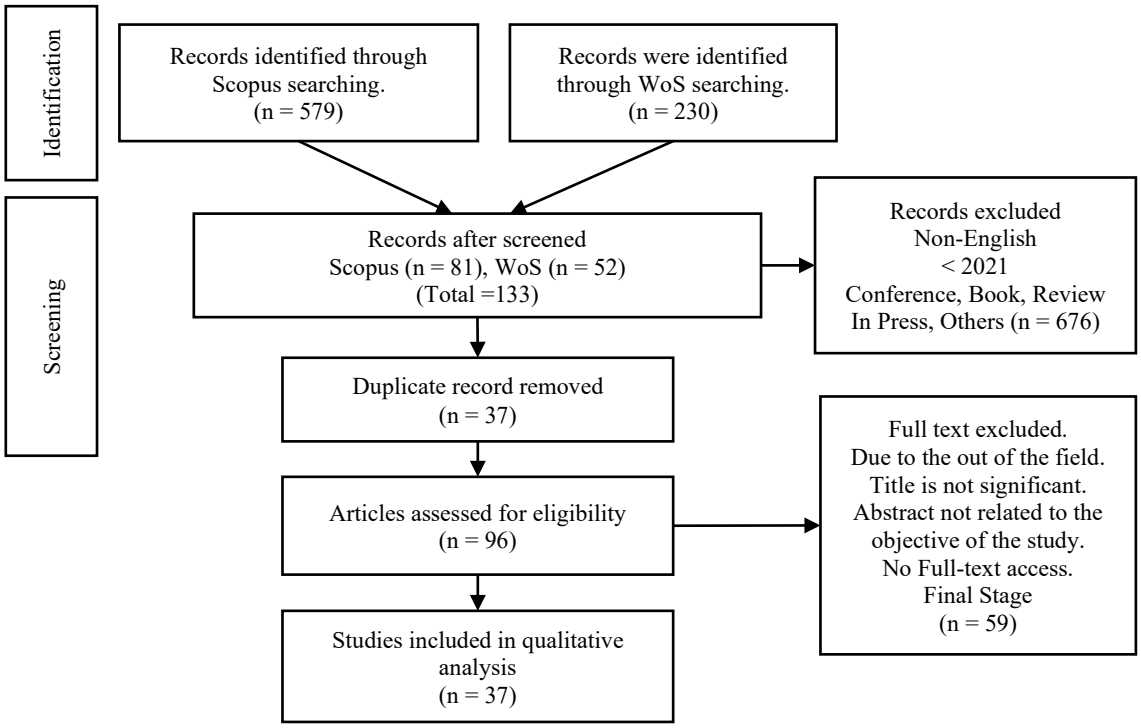

Figure 1. Flow diagram of the proposed search study

The Findings

This review categorizes the key findings into three interconnected dimensions: (1) experiential learning in outdoor and environmental education, (2) innovative pedagogies and applied learning in health, medical, and higher education, and (3) community-based and social learning through experiential approaches. These themes reflect the intricate relationship between hands-on learning strategies, cognitive and social-emotional development, environmental stewardship, community engagement, and technology integration in education. Collectively, they demonstrate how experiential learning cultivates critical thinking, civic responsibility, cultural competence, and sustainability awareness, positioning it as a transformative approach in preparing future generations to navigate complex societal and environmental challenges. Furthermore, this synthesis highlights the significance of inclusivity, ethical practices, and digital innovation in enhancing the impact of experiential education across disciplines.

Experiential learning in outdoor and environmental education leverages direct engagement with nature to foster cognitive, emotional, and social growth. By integrating hands-on exploration, adventure-based activities, and sustainability-focused lessons, this approach enhances critical thinking, environmental stewardship, and holistic well-being. Building on this, outdoor education provides students with real-world experiences that deepen their understanding of ecological systems and promote resilience, curiosity, and problem-solving skills in diverse learning environments. The application of experiential learning in health, medical, and higher education institutions has led to revolutionary changes in traditional teaching methods, focusing on interactive application-based instruction. That is, approaches such as simulation-based learning, problem-based case studies, and technology-enhanced interventions improve clinical competency, decision-making, and patient-centred care. By bridging theory with practice, these pedagogies enhance professional

preparedness, foster interdisciplinary collaboration, and equip students with the adaptability needed for evolving healthcare landscapes.

Table 3. Experiential learning in outdoor and environmental education

Author's Name and Year	Objectives	Findings
Bolick et al. (2022)	Investigate outdoor experiential education impacts on classroom engagement.	Fostered community and innovative teaching practices.
Cincera et al. (2021)	Examine teachers' perceptions of outdoor education.	Improved interpersonal skills; limited environmental impact.
Williams (2022)	Analyze diversity-focused outdoor programs.	Enhanced diversity appreciation among students.
Hu (2022)	Explore nature journaling in early education.	Enhanced sensory engagement and holistic learning.
Mettis et al. (2023)	Assess mobile outdoor learning impacts.	Improved scientific knowledge retention.
Fox and Thomas (2023)	Study climate change in outdoor education.	Limited climate focus in curricula.
North et al. (2024)	Evaluate AI in outdoor education.	AI enhanced accessibility but posed challenges.
Banaag and Stuhr (2024)	Integrate mindfulness into outdoor learning.	Reduced stress and improved focus.
Schmidt and Bobilya (2022)	Engage youth in outdoor education leadership.	Boosted youth leadership and community ties.
Thorsteinsson et al. (2023)	Impact of outdoor time on child relationships.	Improved peer relationships and social skills.
Ouellet and Laberge (2022)	Analyse social dynamics in outdoor groups.	Hierarchies affected participation and inclusivity.
Foss et al. (2024)	Assess parental influence on outdoor activities.	Parental preferences shape children's participation.
Talley et al. (2023)	Impact of adventure programs on adolescent girls.	Increased confidence and nature appreciation.
Chen et al. (2024)	Outdoor education effects on homeschoolers.	Improved physical fitness and teamwork.
Bazna (2023)	Develop an urban outdoor school.	Facilitated outdoor learning in dense areas.

Table 4. Innovative pedagogies and applied learning in health, medical, and higher education

Author's Name and Year	Objectives	Findings
Dagher et al. (2024)	Implement Health Systems Science in medical curricula.	Enhanced interprofessional teamwork and cost awareness.
Luty et al. (2022)	Develop a patient safety simulation curriculum.	Improved skills in patient safety.
Stanulis and Guenther (2021)	Promote ambitious teaching in medical education.	Created responsive learning environments.
Singh and Shah (2021)	Apply Kern's 6-Step Approach in medical education.	Strengthened understanding of health systems.
Bann et al. (2022)	Integrate Social Determinants of Health in teaching.	Enhanced awareness of health disparities.
Yousuf and Yu (2022)	Increase diversity in dermatology curricula.	Improved student cultural competence.
Ard et al. (2022)	Create SGM-focused health education.	Boosted cultural sensitivity among clinicians.
Hughes and Rushton (2022)	Examine ethics education during COVID-19.	Revealed gaps in ethical resilience training.
Blenner et al. (2021)	Evaluate public health internship programs.	Improved diversity and workforce skills.
Gokiert et al. (2021)	Build evaluation capacity in public health.	Strengthened evaluation skills among students.
Gokiert et al. (2024)	Community-university collaboration in evaluation.	Improved community outcomes and evaluation skills.
Birch et al. (2025)	Revise National Health Education Standards.	Updated curriculum guidance for schools.

Community-based and social learning frameworks leverage collaborative, real-world experiences to strengthen civic responsibility, cultural competence, and collective problem-solving. Through service-learning, participatory research, and community-driven initiatives, this approach empowers individuals to engage meaningfully with their surroundings. Hence, by fostering mutual learning between educational institutions and local communities, these strategies cultivate social-emotional skills, ethical leadership, and a

strong sense of community engagement, ensuring that learning extends beyond the classroom into societal impact and sustainable change.

Table 5. Community-based and social learning through experiential approaches

Author's Name and Year	Objectives	Findings
Buzzelli and Asafo-Adjei (2023)	Explore university-community experiential learning.	Enhanced community partnerships and student engagement.
Ramírez-Andreotta et al. (2023)	Co-create environmental health research with communities.	Increased trust and environmental literacy.
Nikandish et al. (2023)	Use field observation in business education.	Improved understanding of process management.
Greedy et al. (2022)	Nature-based placemaking for community vibrancy.	Boosted economic growth and community well-being.
Schmidt and Bobilya (2022)	Youth leadership in community education.	Strengthened leadership and community ties.
Manasia et al. (2023)	Green learning through service-learning.	Enhanced environmental responsibility in students.
Zwart and Hines (2022)	Community wellness in outdoor recreation.	Social connections improved well-being.
Gokiert et al. (2024)	Community-based evaluation capacity building.	Strengthened community and academic collaborations.
Foss et al. (2024)	Evaluate nature-based learning in urban communities.	Promoted community resilience and urban sustainability.
Talley et al. (2023)	Social engagement through outdoor recreation.	Increased community participation and well-being.

Discussion

1. Experiential Learning in Outdoor and Environmental Education

As global challenges like climate change, biodiversity loss, and ecological decline worsen, outdoor education plays a vital role in nurturing environmentally responsible citizens. Immersive experiences in nature have been shown to improve academic performance while strengthening emotional well-being, social development, and environmental awareness. Outdoor experiential learning also boosts student engagement and critical thinking. Bolick et al., (2022) found that teachers who underwent outdoor residencies adopted more inquiry-driven and collaborative teaching practices. This transition supports deeper learning as students link real-life experiences with academic subjects. Similarly, Hu (2022) highlighted the impact of nature journaling on young children's scientific thinking and environmental literacy. Engaging sensory-based exploration helped students build stronger connections with their surroundings. Mettis et al., (2023) reported that learners using mobile outdoor tools demonstrated better conceptual understanding in science compared to traditional classrooms. Technology allowed real-time environmental monitoring, bridging fieldwork with classroom analysis. Collectively, these studies underscore how outdoor education enhances curiosity, critical thinking, and meaningful learning (Bolick et al., (2022); Hu (2022); Mettis et al., (2023).

The core aim of outdoor and environmental education is to shape students who value sustainability. Yet, many programs fall short in embedding sustainability principles throughout the curriculum. Fox and Thomas (2023) found that most outdoor education programs fail to include climate change content, calling for more intentional integration of sustainability themes. North et al. (2024) examined how AI technologies support outdoor education. While AI tools improve environmental data analysis, they also raise concerns over reduced human-nature interaction and privacy. Despite the benefits of predictive insights and real-time data, caution is needed. In another study, North et al., (2023) assessed the Leave No Trace (LNT) ethics framework. While LNT minimizes immediate ecological harm, it lacks depth in addressing broader environmental issues like climate change. The authors proposed using dialectical methods to teach the social and political aspects of sustainability. These findings suggest that outdoor education must evolve beyond surface-level ethics to cultivate deeper, critical understanding of environmental challenges (Fox and Thomas (2023); North et al., 2023, 2024). Natural settings in education enhance students' emotional development, social relationships, and environmental understanding. Williams (2022) found that outdoor activities like team hikes and campfire

discussions promote empathy and cross-cultural respect among university students. Schmidt & Bobilya, (2022) reported that youth-adult partnerships in outdoor programs boost self-efficacy, leadership, and community involvement, with participants gaining confidence in both school and social settings. Thorsteinsson et al, (2023) added that outdoor engagement improves peer interaction, especially for children who face social difficulties in regular classrooms. Collectively, these studies affirm the social-emotional and community-building benefits of outdoor education (Schmidt & Bobilya, 2022; Thorsteinsson et al, 2023; Williams 2022).

Despite these benefits, outdoor experiential learning faces structural challenges such as access, equity, and curriculum integration Ouellet & Laberge, (2022) showed that gender and skill perceptions shape group dynamics, with marginalized students, particularly women and students of colour receiving fewer opportunities. Foss et al. (2024) highlighted how family income and parental preferences influence children's access to outdoor learning, often disadvantaging low-income households. Bazna, (2023) illustrated how urban barriers like limited green space and safety concerns make outdoor education in cities difficult. However, creative use of parks and community gardens shows that urban outdoor learning is still possible. Addressing these barriers requires inclusive policies and equitable access to ensure all students benefit from outdoor education (Bazna, 2023; Foss et al. 2024; Ouellet & Laberge, 2022). Several studies underline the psychological advantages of outdoor learning. Banaag & Stuhr, (2024) introduced the Mindful Lived-Outdoor Experience (MLOE), demonstrating how mindfulness in nature reduces stress and improves emotional regulation. Talley et al., (2023) using photo-elicitation interviews, found that adolescent girls in adventure programs gained resilience, confidence, and leadership. Meanwhile, Chen et al., (2024) studied home-schooled students and found that regular outdoor learning strengthened physical health, teamwork, and conflict resolution. These findings confirm that outdoor experiential education greatly enhances mental well-being, emotional strength, and holistic student development (Banaag & Stuhr, 2024; Chen et al., (2024); Talley et al., 2023).

2. Innovative Pedagogies and Applied Learning in Health, Medical, and Higher Education

The healthcare landscape demands future medical professionals to acquire problem-solving skills while developing cultural competency and sound ethical frameworks because of COVID-19 and health disparity challenges alongside climate change and accelerating technology (Dagher et al., 2024; Hughes & Rushton, 2022; Singh & Shah, 2021). Students learn clinical abilities and improve their decision-making skills and cultivate teamworking competencies through Simulation-Based Education in its role as a risk-free practice space. The study conducted by Luty et al. (2022) evaluated the establishment of a centralized Simulation-Based Medical Education (SBME) program that enhanced student abilities to think critically and solve problems while improving their communication skills. The subjects felt empowered to take on complex clinical challenges. The simulation patients led participants to make better choices and show higher accuracy levels, thus establishing that practical healthcare learning produces capable healthcare providers.

The VISTA program by Dagher et al. (2024) served as a practical extensive course that integrated Health Systems Science (HSS) through curriculum delivery of interprofessional teamwork and cost-efficient care and patient protection methodologies. Survey evaluations indicated that students who participated in the program displayed superior competencies regarding both patient safety protocols and resource allocation, as well as patient communication skills when compared to their non-participating peers. Through its extended program duration, students gained complete knowledge of healthcare systems, which filled the disconnect between theoretical knowledge and practical application in medical education. Through simulation-based medical education, students learn both clinical expertise as well as moral and social abilities. The researchers from Zumwalt et al. (2022) showed how medical school curricula teach Sexual and Gender Minority (SGM) health concepts using case-based simulations that present various patient scenarios. Research data demonstrated that simulation methods improved medical students' competence regarding SGM patients as they demonstrated better abilities to understand this patient population. The research evidence confirms SBE as an essential element of current medical education because it develops clinical abilities along with safety

protocols while also building cultural competence capacities (Dagher et al., 2024; Ismail et al., 2022; Luty et al., 2022; Zumwalt et al., 2022).

Social Determinants of Health (SDOH) have gained significant recognition in medical education throughout the previous years. Healthcare professionals who show community care need to understand how social status, racial background, gender identity, and local location impact health results. Bann et al. (2022) investigated SDOH integration in current undergraduate medical education programs. Research findings demonstrated that students who completed fieldwork activities in community-based case studies developed both improved health disparity knowledge and enhanced empathy. Training for medical students requires development to help them incorporate broader patient conditions when making clinical decisions. Likewise, Singh and Shah (2021) applied Kern's 6-Step Approach to curriculum development, incorporating SDOH and health equity content into medical education. The modified educational system helped students understand health-related social factors better and motivated them to advocate for systemwide healthcare changes. Students gained better skills to identify health disparities in clinical environments, thus improving their ability to deliver full patient care. Community-engaged learning programs succeed at developing cultural competency through their work of improving community relationships. Blenner et al. (2021) investigated the public health internship programs that placed students in underserved communities. Hands-on learning opportunities for students allowed them to test public health theories in real-world settings, which produced better academic results and meaningful community benefits. When they become professionals, students will continue to show commitment to helping deprived communities because they have demonstrated improved skills in serving various populations during their public health internship. Research demonstrates that medical education becomes more clinically effective along with producing better community advocates who practice ethics when social determinants are integrated into the curriculum (Bann et al., 2022; Blenner et al., 2021; Singh & Shah, 2021).

The development of cultural competence in contemporary healthcare education began because medical schools produce practitioners who deliver appropriate care to diverse populations. The education of dermal conditions continues to struggle with teaching accurate skin condition representations among patients with different skin tones, according to Yousuf and Yu (2022). Students demonstrated enhanced skills in diagnosing dermatological conditions in patients with dark skin when their education included diversity-focused skin tone photos along with clinical illustrations. The enhanced training system stands as a solution for diminishing racial healthcare disparities. Ethics education needs cultural competency to deliver effective results in crisis situations since cultural awareness stands essential during these critical moments. Healthcare education showed crucial ethical flaws during the COVID-19 pandemic concerning fair resource distribution and personnel welfare, according to Hughes and Rushton (2022). Healthcare students need immediate ethics education to acquire abilities that solve multifaceted ethical challenges with empathy and professional ethics standards per their research. The research shows that cultural competence, together with inclusivity, matters in healthcare education by validating curricula that reflect actual patient communities and societal advancements (Ard et al., 2022; Hughes & Rushton, 2022; Yousuf & Yu, 2022). Training healthcare professionals with diverse perspectives and ethical reasoning methods through educational programs results in providers who deliver equitable medical care to all patients. Healthcare professionals need to develop cultural competence skills together with community engagement abilities and ethical decision-making competence because these competencies produce healthcare providers who show empathy while adaptability and deliver socially responsible care during global healthcare challenges.

3. Community-Based and Social Learning through Experiential Approaches

Complementing the pedagogical transformations in outdoor and health education settings, community-based experiential learning bridges formal instruction with local contexts. This theme completes the learning continuum by anchoring educational practices within real-world civic and environmental engagement, reinforcing the holistic impact initiated by the first two themes. Academic institutions and local communities play a central role in community-based education by forming collaborative partnerships that support shared learning and problem-solving. Gokiert et al. (2021), (2024) introduced Evaluation Capacity Building (ECB)

as a strategy to develop students' program evaluation skills while enhancing the impact of community health initiatives. Long-term collaborations strengthen students' real-world competencies and build resilient, solution-oriented communities (Birch et al., 2025). Experiential programs that include authentic tasks foster critical thinking and civic engagement, transforming students into active contributors to their communities. Environmental education has also adopted these approaches, promoting sustainability and ecological awareness through community partnerships. Ramirez-Andreotta et al., (2023) highlighted how co-designed environmental health science projects not only improved scientific rigor but also built trust and empowered communities. Participants who engaged in the full research cycle became more environmentally aware and committed to local sustainability efforts. Similarly, Greedy et al. (2022) examined nature-based placemaking, showing how green infrastructure in urban areas improves public health, strengthens social ties, and drives economic revitalization. Participants in these projects felt a stronger sense of belonging and became more active in environmental civic initiatives. In rural contexts, Manasia et al., (2023) found that service-learning linked to environmental education deepened students' understanding of sustainability issues and encouraged collaborative problem-solving with community members. These experiences fostered a lasting sense of environmental responsibility and professional commitment to sustainability. Together, these studies show that community-integrated education not only benefits students' personal and academic growth but also advances local environmental progress and sustainable development (Greedy et al., 2022; Manasia, Parvan, et al., 2023; Ramirez-Andreotta et al., 2023).

Outdoor learning that integrates recreation and community engagement effectively builds social connections, improves mental health, and encourages civic participation. . Zwart and Hines (2022) found that community-led outdoor programs reduce stress and strengthen social support networks, fostering a deeper sense of belonging. Shared natural experiences were identified as vital spaces for enhancing community cohesion. Schmidt and Bobilya (2022) reported that youth participating in community-based outdoor programs developed leadership skills through active roles in planning, decision-making, and advocacy. These opportunities nurtured confidence and civic responsibility while promoting innovative leadership contributions. Similarly, Nikandish et al. (2023) showed that field-based learning in process management led to better critical thinking, system comprehension, and real-world knowledge application. Collectively, these findings demonstrate that outdoor and community-anchored education promotes personal growth, leadership, and stronger community ties (Nikandish et al. (2023) ; Schmidt and Bobilya (2022); Zwart and Hines (2022).

Despite these benefits, concerns around equity, access, and cultural sensitivity continue to pose challenges. Buzzelli and Asafo-Adjei (2023) revealed that community-university partnerships can reinforce structural inequalities when institutions dominate decision-making and resource distribution. In some cases, expansion efforts displaced vulnerable communities. The authors urged for policies that ensure equitable resource sharing and active community participation. Gokiert et al. (2024) stressed the need for culturally responsive evaluation in community-based learning programs to ensure relevance and inclusion for all stakeholders. This participatory approach not only strengthens program outcomes but also builds lasting trust between academic and local groups. Ramírez-Andreotta et al. (2023) further emphasized that centring community voices and traditional knowledge in environmental research promotes justice and empowers marginalized populations. Together, these studies underscore that for community-based experiential education to succeed, it must be grounded in equity, mutual respect, and culturally sensitive collaboration (Buzzelli and Asafo-Adjei (2023); Gokiert et al. (2024); Ramírez-Andreotta et al. (2023). While this review offers a valuable synthesis of current outdoor health education strategies, several methodological limitations were observed across the studies reviewed. Many employed small sample sizes, lacked control groups, and focused on short-term outcomes, limiting the generalizability of findings. Additionally, few studies incorporated longitudinal designs, which restrict the ability to measure long-term health behavior changes. Cultural and contextual differences across countries also present challenges in standardizing outdoor health education models. These limitations underscore the need for future research to adopt more rigorous, comparative, and context-sensitive methodologies.

Conclusion

This review points out the life-changing effects of outdoor experiential education when integrated into health curricula. Through a synthesis of 37 studies, it is evident that experiential, adventure-based, and community-anchored strategies significantly enhance student engagement, health literacy, and social responsibility. These pedagogical models bridge theory and practice, support emotional and physical well-being, and cultivate civic values. While implementation challenges remain, such as curriculum alignment, safety, and access, addressing these barriers can ensure inclusive, scalable, and impactful health education. Future research should adopt longitudinal and context-sensitive designs to further validate the efficacy of outdoor-based models in diverse learning environments.

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