# Exploring effective strategies for health education in schools: a systematic review

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## Article Info

## ABSTRACT

Considering the pressing need for effective health education in primary schools, this systematic review rigorously evaluates various strategies designed to enhance students' health knowledge, attitudes, and behaviours. The primary objective of this study is to assess the efficacy, challenges, and outcomes of health education programmes that utilise interactive and participatory methods, such as project-based learning and peer education. The study methodology adheres to the preferred reporting items for systematic reviews and meta-analyses or PRISMA framework. Utilising advanced search techniques across Scopus and Web of Science (WoS) databases, a total of (n=35) relevant studies between 2020 to 2024 were identified and subjected to thorough analysis. This article synthesizes findings from the final articles into three main themes: Integrative approach in health education, digital and distance learning strategies (DDLS), and ethical and cultural challenges in health education. This review underscores the critical importance of integrating health education within the broader school curriculum, actively involving parents and the community, and implementing culturally tailored approaches. The review shows positive outcomes but also highlights the need for better teacher training and resource allocation, requiring collaboration from educators and policymakers. It emphasizes the potential of these strategies to foster lifelong healthy behaviors and calls for more research to address challenges and assess long-term effects.

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## 1. INTRODUCTION

Health education is a crucial component of a comprehensive school health programme. It equips students with the knowledge, attitudes, and skills necessary to adopt and maintain healthy behaviours throughout their lives. In recent years, there has been a growing recognition of the role that schools play in promoting the overall well-being of children and adolescents. This is because they spend a significant portion of their formative years within the educational setting [1], [2]. Therefore, by fostering a culture of health and wellness from an early age, schools can lay the foundation for lifelong positive habits and contribute to the prevention of various health issues, including chronic diseases, mental health problems, and risky behaviours [3], [4]. Notably, the significance of health education in primary and elementary schools cannot be overstated. These formative years are critical for shaping attitudes, beliefs, and behaviours related to health, as children are highly receptive to learning and developing new skills during this period [5]. Effective health

education programmes in elementary schools have the potential to empower young students with the knowledge and tools necessary to make informed decisions about their health, establish healthy habits early on, and develop resilience against negative influences and risky behaviours [6].

However, the effective implementation of health education in primary schools depends on adopting strategies that are tailored to the developmental needs of young learners [7], [8]. Traditional lecture-based teaching methods often fail to engage students, necessitating the use of more interactive and innovative approaches that capture their attention and promote active participation [1], [9]. Integrating health education into existing curricula across subjects like science, language arts, and social studies, offers a way to reinforce health concepts and make them more relatable to everyday life [10]–[12]. Additionally, experiential learning techniques such as role-playing, simulations, and hands-on activities help make health education more engaging and relevant by tapping into students' senses and emotions, while fostering critical thinking and decision-making skills needed for real-world health situations [3], [13]. Incorporating digital tools, like interactive platforms and multimedia presentations, also plays a crucial role in aligning with students' learning preferences in today's digital era, enhancing comprehension and offering opportunities for self-paced learning [14], [15]. Moreover, engaging families and communities in health education initiatives is essential, as their involvement strengthens the support system around students and helps sustain healthy behaviours outside the classroom [16], [17]. It is also important to consider factors such as cultural backgrounds and socioeconomic status when designing these programmes, as these can influence the effectiveness of health education and determine how well it meets the needs of different populations [18].

To build on the earlier discussion of health education in primary schools, it is essential to highlight the methodology used in this review. Systematic literature reviews (SLRs) are valuable tools for synthesising existing knowledge and identifying gaps for further research. Selecting appropriate academic search systems, such as Google Scholar and PubMed, is crucial for retrieving relevant and high-quality studies, as noted by Gusenbauer and Haddaway [19]. A meticulous approach to the review process is necessary to generate reliable evidence across diverse fields [20]. Effective SLRs not only summarise existing findings but also map out research gaps, which enhances the impact of the review through strategic citation techniques, as Lingard [21] emphasised. Understanding the distinction between systematic and scoping reviews is equally important, with Munn *et al.* [22] and Peterson *et al.* [23] offering guidance on choosing the right approach based on research objectives. For beginners, mastering systematic review methodologies is crucial, as discussed by Shaffril *et al.* [24], who provided essential guidance. Moreover, Snyder [25] highlighted the importance of rigorous methodological frameworks in producing comprehensive and reliable literature reviews. This review follows these principles to explore key studies related to health education in primary schools, offering insights into effective strategies and areas requiring further investigation

For this study, health education in primary schools plays a key role in shaping children's lifelong habits and attitudes toward health. Research has consistently shown the importance of adopting comprehensive strategies for effective implementation. Otten *et al.* [26] highlighted the HealthLit4Kids initiative, which focused on improving teachers' ability to teach health literacy (HL) through professional development workshops. While teachers valued integrating HL into their lessons, they faced challenges such as time constraints and limited resources. This shows that more support is needed for teachers to implement HL effectively. Likewise, Aydin *et al.* [27] explored parents' views on food and nutrition education (FNE) in Australian schools. Parents believed FNE was just as important as core subjects and supported hands-on activities like cooking and gardening to promote healthy eating. They also stressed the need for schools to align FNE with broader sustainability goals and policies, ensuring it becomes a lasting part of the curriculum.

Furthermore, health education in primary schools includes key components such as HL, nutrition, and physical education (PE), all of which are vital for children's overall well-being. Williams *et al.* [28] highlighted the challenges in PE assessment practices within the Australian Capital Territory, noting a reliance on skill assessment over game strategy and the need for evidence-based methods. Professional development is necessary to address this gap and improve physical literacy. Similarly, Liu *et al.* [29] examined health-related fitness testing (HRFT) in physical education teacher education (PETE) programmes, identifying challenges like limited field experience for pre-service teachers. Despite these, peer teaching and required courses proved effective, underscoring the need for more practical experience and mentorship to better prepare future teachers.

A broader view of health education also considers the social determinants of health (SDH). Ali *et al.* [30] and Molitor *et al.* [31] highlighted the value of integrating SDH into education through community partnerships and reflective learning, which enhanced students' understanding of social factors influencing health. Such experiential approaches could be beneficial in primary health education as well. Additionally, Ramos-Carrillo and Moreno-Perez [32] found that a multivariate screening approach was most effective for detecting reading difficulties (RD), emphasizing the need for comprehensive, tailored strategies. These findings suggest that health education programmes must be holistic, addressing physical, nutritional,

and social dimensions to meet diverse student needs. Collectively, these studies underscore the multifaceted nature of health education, highlighting the need for integrated approaches that address physical, nutritional, and social aspects of student health.

To construct a relevant systematic review, this article addresses the following main research questions (RQ): i) how do integrative approaches combining traditional and alternative health education methods, impact the HL and health outcomes of diverse populations? ii) what are the most effective DDLS for enhancing engagement and retention in health education programs among undergraduate students? and iii) how do ethical and cultural challenges influence the development and implementation of health education curricula in multicultural settings?

## 2. MATERIAL AND METHODS

### 2.1. Identification

Three essential stages of the systematic review process were implemented to select a substantial number of relevant publications for this study. In the initial stage, keywords were identified, and synonymous terms were searched using thesauri, dictionaries, encyclopaedias, and prior research. Subsequently, search strings were formulated for the Scopus and Web of Science (WoS) databases, as in Table 1, incorporating all relevant keywords. During this preliminary phase of the systematic review process, 602 publications were successfully retrieved from both databases for inclusion in the current study.

Table 1. The search string

| Database | Search string |
|---|---|
| Scopus | TITLE-ABS-KEY (health AND education AND approach AND learning AND teaching AND strategies AND school) 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)) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English")) <br> Date of access: May 2024 |
| WoS | health AND education AND approach AND learning AND teaching AND strategies AND school (Topic) and 2024 or 2023 or 2022 or 2021 or 2020 (Publication Years) and 2024 or 2023 or 2022 or 2021 or 2020 (Final Publication Year) and Article (Document Types) and English (Languages) and English (Languages) <br> Date of access: May 2024 |

### 2.2. Screening

During the screening stage, relevant research items are examined for content alignment with the research question(s). Content-related criteria frequently employed in this phase include the selection of research items based on their relevance to exploring effective strategies for health education in primary schools. At this step, duplicate papers are systematically removed from the list of retrieved papers. Initially, 434 publications were excluded during the first stage of screening. The second stage involved examining 168 papers using various exclusion and inclusion criteria specific to this study, as in Table 2. The primary criterion utilised was the inclusion of literature (research papers). This also encompassed reviews, meta-syntheses, meta-analyses, books, book series, chapters, and conference proceedings that were not covered in the most recent study. Additionally, the review was restricted to publications in English and focused on the period from 2020 to 2024. In total, 39 publications were rejected based on duplication criteria.

Table 2. The selection criterion is searching

| Criterion | Inclusion | Exclusion |
|---|---|---|
| Language | English | Non-English |
| Timeline | 2020–2024 | <2020 |
| Literature type | Journal (article) | Conference, book, and review |
| Publication stage | Final | In press |
| Subject | Social science | Others |

### 2.3. Eligibility

In the third phase (eligibility assessment), a total of 131 articles were compiled. During this phase, an examination of the articles' titles and main content was conducted to verify the inclusion criteria and relevance to the study's research objectives. As a result, 96 articles were excluded for reasons including being out of scope, having titles or abstracts that were not significantly related to the study's aims, or lacking full-text access. Consequently, 35 articles were retained for further review.

## 2.4. Data abstraction and analysis

In this study, an integrative analysis was employed to examine and synthesize various research designs focusing on quantitative methods. The process began with the data collection phase, which laid the groundwork for theme development. Figure 1 illustrates the meticulous analysis of 35 publications, highlighting assertions and materials relevant to the study's themes. Subsequently, the authors evaluated studies on effective health education strategies in primary schools, considering both methodologies and research outcomes. Collaboration with co-authors was crucial in developing themes based on the gathered evidence. Throughout the data analysis process, a log was maintained to record analyses, viewpoints, puzzles, and thoughts pertinent to data interpretation. The authors then compared the results to identify any inconsistencies in the theme design process. Any conceptual disagreements were resolved through discussion among the authors, ensuring the themes' consistency. Two experts-one specializing in health teaching methods and the other in curriculum development-conducted the analysis selection to validate the identified issues. The expert review phase confirmed each subtheme's clarity, significance, and appropriateness, thereby establishing domain validity.
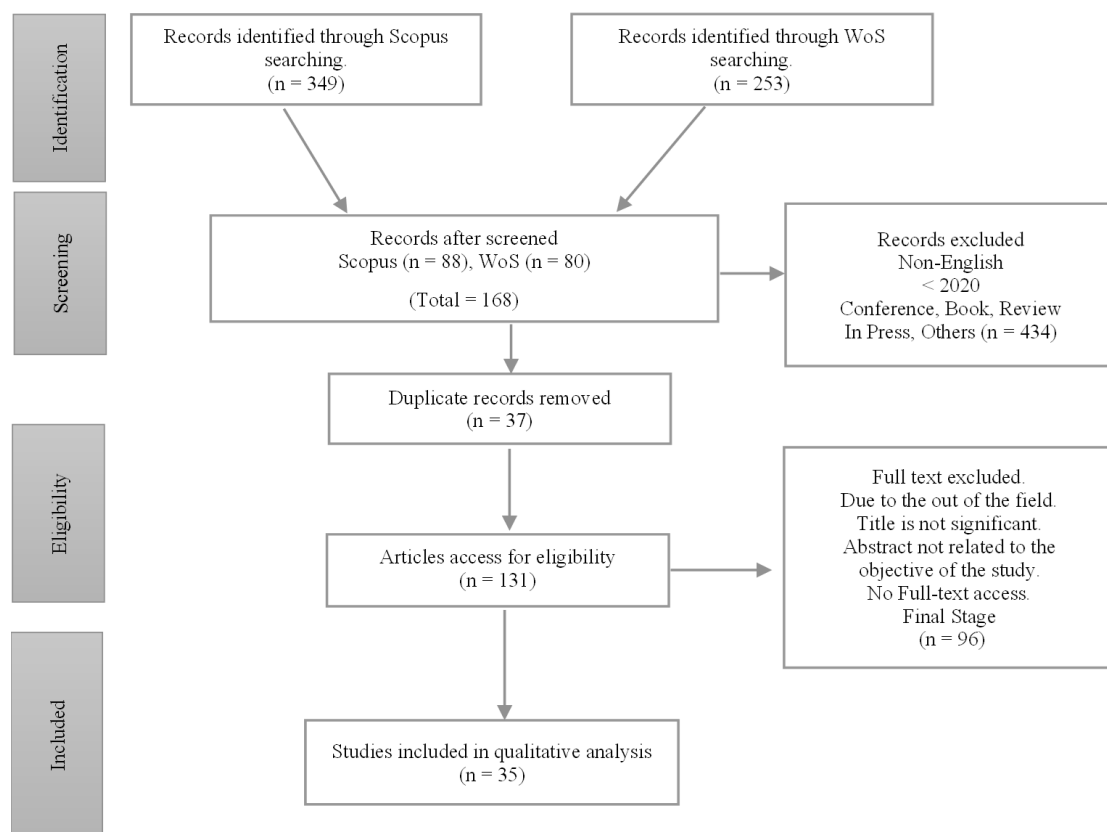


Figure 1. Flow diagram of the proposed search study [1]

## 3.    RESULT AND FINDING

The review identified three main themes related to the methods and approaches discussed in selected journal articles, focusing on factors such as programme design, implementation strategies, and the role of school staff in enhancing health education. The three main themes were "integrative approaches in health education", "digital and distance learning strategies," and "ethical and cultural challenges in health education". The findings offer a thorough analysis of delivery strategies for health education, which can enhance the success of these programs.

## 3.1. Integrative approaches in health education

Integrative approaches in health education emphasise a holistic view of students' well-being by embedding multiple health behaviours and life skills into the school curriculum. For example, Velasco et al. [33] underscored the importance of life skills education to facilitate the transfer of learning in

various health behaviours. Their study highlighted the necessity of comprehensive health programmes beyond mere information dissemination to include practical skill development, enabling students to apply these skills in different contexts. Similarly, Villela and Paula [34] explored innovative strategies for evaluating teaching-learning processes in public health, stressing the role of continuous assessment in improving the effectiveness of health education initiatives. This approach ensures that programmes remain relevant to students' needs, enhancing their overall impact. Both studies in [33] and [34] highlight the importance of embedding health behaviours and life skills into the curriculum.

Alternatively, Faria *et al.* [35] contributed to the discourse by discussing lesson-study models in health education with pre-service biology teachers. Their research demonstrated that such models can facilitate the integration of health concepts across various subjects, fostering an interdisciplinary approach to health education. This method enriches the learning experience for students and equips teachers with the skills to effectively incorporate health education into their teaching practices. Velasco *et al.* [36] provided further insights into the adaptability of life skills education during the COVID-19 pandemic. Their study revealed that expert educators modified their strategies to address emerging health challenges, highlighting the flexibility and resilience of integrative health education frameworks. The ethical and cultural dimensions of health education are crucial in diverse educational settings. Meanwhile, Rodger *et al.* [37] discussed the importance of trauma-informed care in initial teacher education, emphasising the need for educators to be sensitive to the varied experiences of students. They highlighted how an understanding of trauma and violence can inform effective health education practices. Similarly, Ramalepa *et al.* [38] examined the ethical complexities involved in integrating reproductive health education in culturally diverse settings. Both studies in [37] and [38] focused on the ethical and cultural dimensions of health education. Their findings align with Villela and Paula [34], who underlined the importance of culturally sensitive approaches that respect students' backgrounds while providing essential health information. De Padrão *et al.* [39] highlighted the role of peer education in addressing sensitive health topics, demonstrating how peer-led initiatives can create a supportive environment for discussing health issues, similar to Harbell *et al.* [40].

Community involvement is another critical aspect of integrative health education. Astuti *et al.* [41] emphasised the significance of community engagement in school health programmes. Their study indicated that involving parents, local health professionals, and community members can enhance the effectiveness of health education initiatives. This collaborative approach ensures that health education is confined to the classroom and extends into the broader community, fostering a more supportive and health-conscious environment for students Quesnelle *et al.* [42]. Both studies in [41] and [42] correlate on the theme of community involvement in health education. Similarly, Walker *et al.* [43] discussed the benefits of providing students access to natural environments in their health education. Their research indicated that this approach can significantly enhance students' physical and mental well-being. Innovative teaching methods and curricula are essential for the successful implementation of integrative health education.

Lander *et al.* [44] highlighted the importance of embedding active pedagogies within pre-service teacher education. Their study suggested that hands-on, interactive teaching methods can better engage students and improve their understanding of health concepts. Keuroghlian *et al.* [45] emphasised the necessity of inclusive and equitable approaches in health education, ensuring that all students, regardless of their background, have access to high-quality health education. This perspective aligns with the findings of Baxter *et al.* [46], who discussed the use of digital tools to enhance engagement in health education. Their qualitative study revealed that incorporating technology can make health education more interactive and engaging for students, thus improving their learning outcomes. This approach aligns with the findings of Allen *et al.* [47], who emphasised the importance of teaching health promotion competencies in undergraduate dentistry training. Their study highlighted how integrative approaches can be applied in higher education to ensure that future health professionals are well-equipped with the necessary skills and knowledge. Both studies in [44] and [46] focused on innovative teaching methods and curricula, while studies in [45] and [47] aligned on the necessity of inclusive and equitable approaches in health education.

Integrative approaches in health education promote a holistic understanding of well-being by embedding diverse health behaviours, life skills, and interdisciplinary learning into the school curriculum. These methods emphasize practical skill development, continuous assessment, and culturally sensitive teaching, enhancing the relevance and impact of health education programmes. Furthermore, community involvement and innovative teaching strategies, including the use of digital tools and active pedagogies, play a crucial role in making health education more engaging, inclusive, and effective for students across various educational settings.

## 3.2. Digital and distance learning strategies (DDLS)

DDLS have revolutionised health education, particularly in response to the COVID-19 pandemic. Baxter *et al.* [46] examined the strategic planning for digital education in English secondary schools, emphasising the pandemic as a significant educational change. Their quantitative study revealed that schools

had to rapidly adapt to online platforms, leading to the development of new digital strategies and tools to ensure continuous learning. Similarly, Vilchez *et al*. [48] focused on distance learning in PE, highlighting the challenges and adaptations required to maintain student engagement and physical activity levels during remote learning. Their research underscored the importance of flexible and resilient digital strategies in overcoming the limitations imposed by distance learning environments. Both studies in [46] and [48] explore the challenges and rapid adaptations needed in education due to the COVID-19 pandemic. Meanwhile, Lee *et al*. [49] further contributed by showcasing the benefits of e-books with sequential multi-level prompting strategies, which significantly improved learning retention, self-efficacy, and problem-solving skills among students.

The integration of digital tools in health education extends beyond pandemic responses. Palau *et al*. [50] explored the post-pandemic vision of Spanish schools, advocating for the sustained use of digital technologies to enhance the educational experience. Their qualitative study suggested that digital tools could create more interactive and engaging learning environments, improving student outcomes. Dunlop *et al*. [51] supported this view by examining the role of digital learning tools in health education. They discovered that these tools facilitated the delivery of health education content and enabled continuous assessment and feedback, which are crucial for effective learning. Both studies by [50] and [51] advocate for the continued integration of digital tools in education to enhance the learning experience. Bezeau *et al*. [52] also highlighted the importance of evaluating health education programmes through digital platforms, suggesting that such evaluations can provide valuable insights into the effectiveness of various teaching methods and strategies.

Innovative teaching methods and curricula are essential for the successful implementation of DDLS. Harbell *et al*. [40] discussed the use of digital tools to teach systems improvement to early medical students. Their qualitative study indicated that digital platforms could enhance the learning experience by facilitating the understanding of complex concepts in health systems. Quesnelle *et al*. [42] examined the design of a foundational sciences curriculum that incorporated digital learning strategies. They demonstrated that applying the ICAP framework (interactive, constructive, active, and passive) to pharmacology education could significantly improve student engagement and learning outcomes. Knopik *et al*. [53] further illustrated the benefits of digital learning strategies in supporting students with special educational needs during emergency remote learning situations. DDLS also promotes inclusivity and accessibility in health education. Studies in [40] and [42] correlate with the theme of using digital tools to enhance complex learning experiences in health education, while [42] and [53] emphasize the importance of applying digital learning strategies to improve student engagement. Allen *et al*. [47] discussed the implementation of active pedagogies within pre-service teacher education, emphasising the use of digital tools to accommodate diverse learning needs. Their research suggested that digital platforms could provide flexible and personalised learning experiences, supporting the inclusion of all students. Viloria [54] explored the impact of public health education initiatives using digital tools, highlighting their role in bridging geographical barriers and providing high-quality education to students in different regions. Her study also emphasised the importance of effective health communication in educational settings, highlighting how digital tools can facilitate better student communication and understanding. Both studies in [47] and [54] emphasize the role of digital tools in enhancing accessibility and inclusivity in education.

Digital and distance learning strategies have significantly transformed health education, especially during the COVID-19 pandemic, by enabling schools to adapt quickly to online platforms and develop innovative digital tools for continuous learning. These strategies have proven essential in maintaining student engagement, facilitating flexible learning environments, and enhancing educational outcomes through the use of digital platforms. Beyond the pandemic, the integration of digital learning tools continues to support inclusivity and accessibility, making health education more engaging and adaptable to the needs of all students across various educational settings.

### 3.3. Ethical and cultural challenges in health education

Addressing ethical and cultural challenges in health education requires a nuanced understanding of the diverse contexts in which education occurs. Allen *et al*. [47] emphasised the significance of cultural sensitivity in designing and implementing health education programmes. Their study highlighted the necessity for educators to respect and incorporate cultural differences to enhance the effectiveness of health initiatives. Similarly, [48] discussed the ethical implications of improving teaching systems for early medical students. Their findings suggested that ethical frameworks are crucial in guiding educational practices and helping students understand the broader impacts of their decisions in healthcare settings.

Incorporating ethical considerations into the health education curriculum is essential for addressing cultural challenges. Quesnelle *et al*. [42] explored the design of foundational sciences curricula that integrate ethical and cultural competencies. Their research indicated that embedding these competencies enhances students' ability to navigate ethical dilemmas and cultural issues effectively. This aligns with the perspectives

of Shipton *et al*. [55], who advocated for integrative approaches encompassing educational content and delivery methods to comprehensively address ethical and cultural challenges. Notably, the role of community involvement in addressing ethical and cultural challenges in health education cannot be overstated. Both studies in [42] and [55] advocate for integrative educational approaches that address ethical and cultural challenges. Astuti *et al*. [41] emphasised the importance of engaging the community in school health programmes. Their study indicated that involving parents, local health professionals, and community members can enhance the relevance and impact of health education initiatives. This collaborative approach ensures that health education extends beyond the classroom and fosters a supportive and inclusive environment. Similarly, De Padrão *et al*. [39] highlighted the role of peer education in addressing sensitive health topics, demonstrating how peer-led initiatives can create a safe space for discussing health issues. The studies in [41] and [39] emphasize community involvement and peer education as vital strategies for addressing cultural and ethical challenges in health education.

The integration of digital tools in addressing ethical and cultural challenges is another significant aspect of modern health education. Dunlop *et al*. [51] discussed the use of digital learning tools to facilitate discussions on ethical and cultural topics. Their research suggested that digital platforms can provide interactive and engaging environments where students can explore complex issues collaboratively.

Bezeau *et al*. [52] further illustrated the benefits of digital tools in evaluating health education programmes, suggesting that such evaluations can offer insights into how well ethical and cultural aspects are addressed in the curriculum. Studies in [51] and [52] correlate in exploring the use of digital tools to address ethical and cultural challenges in health education. Thus, addressing the ethical challenges associated with reproductive health education is particularly important in culturally diverse settings. Ramalepa *et al*. [38] discussed the complexities of delivering reproductive health education in schools within Tshwane District, South Africa. Their study underscored the need for culturally sensitive approaches considering the ethical implications of reproductive health topics. Yang [56] highlighted the importance of ethical leadership in health education, suggesting that educators must model ethical behaviour and decision-making to address cultural challenges in the classroom effectively. Studies in [38] and [56] focus on addressing ethical challenges in culturally diverse settings.

Addressing ethical and cultural challenges in health education requires a comprehensive approach that respects and incorporates diverse contexts and community involvement. Studies have shown that integrating ethical and cultural competencies into curricula, engaging local communities, and using digital tools can enhance the relevance and impact of health education initiatives, fostering a more inclusive and supportive learning environment. By embedding these competencies and involving stakeholders, health education can better navigate ethical dilemmas and cultural sensitivities, ultimately improving the effectiveness of health programmes.

## 4.    DISCUSSION

The systematic review of health education strategies in primary schools highlights several critical insights that can inform future practices and policies. One of the primary findings is the significant role of interactive and participatory methods, such as project-based learning and peer education, in enhancing students' health knowledge, attitudes, and behaviours. These methods are more effective than traditional lecture-based approaches, as they actively engage students, making the learning process more memorable and impactful. Moreover, the integration of health education within the broader school curriculum is essential [57]. Thus, by embedding health topics into various subjects, schools can provide a holistic learning experience that reinforces the importance of health. For instance, incorporating health education into science classes can help students understand the biological aspects of health. Hence, integration into social studies can highlight the societal impacts of health behaviours.

Overall, the research suggests that health education in schools should not only focus on physical health but also on mental, emotional, social, and environmental aspects [2], [38]. By incorporating innovative and culturally relevant strategies, educators can better engage students and empower them to make informed decisions about their health. Additionally, by addressing societal challenges such as infectious diseases, climate change, and social inequalities, health education can promote a more sustainable and equitable future. Moving forward, educators, policymakers, and researchers need to collaborate in developing and implementing effective health education programmes. This includes conducting further research to evaluate the impact of different strategies, adapting curriculum to meet the specific needs of diverse populations, and advocating for integrating health education into broader educational initiatives.

By implementing these strategies, schools can create a culture of health and wellness that benefits students during their time in school and equips them with the tools they need to lead healthy lives beyond graduation. Additionally, by prioritising student engagement and psychosocial health, schools can help

students develop resilience, coping skills, and a positive attitude toward their own well-being [58]. Furthermore, by incorporating interprofessional education and patient partnerships, schools can provide students with a holistic understanding of health and wellness and opportunities to learn from diverse healthcare professionals. In addition, peer-led initiatives can also empower students to take ownership of their health and well-being. At the same time, innovative pedagogical approaches and technology can make health education more engaging and accessible.

Our review suggests that integrative and participatory approaches in health education are more effective than traditional lecture-based methods for enhancing student engagement and learning outcomes. Future studies may explore the long-term impact of these approaches on student health behaviours and academic performance, focusing on developing scalable and culturally adaptable strategies for diverse educational settings. Additionally, the research could investigate feasible ways of incorporating advanced digital tools and community involvement to further strengthen the effectiveness of health education programmes in primary and elementary schools.

## 5.    CONCLUSION

The findings of this systematic review highlight the critical role of integrative and interactive health education approaches in primary schools. Schools can significantly improve students' health knowledge, attitudes, and behaviors by implementing methods such as project-based learning, peer education, and digital tools. Effective health education requires innovative teaching strategies, the integration of health topics across the curriculum, and the active involvement of parents and the community. Addressing challenges like teacher training and resource allocation is vital for the successful delivery of these programmes. Furthermore, collaboration among policymakers, educators, and stakeholders is essential to prioritise and support health education initiatives. Ultimately, fostering a holistic and culturally relevant approach within schools can empower students to adopt lifelong healthy behaviours, contributing to their overall well-being and the prevention of various health issues. Continued research and innovation are needed to further enhance the impact of health education and address existing challenges.

## AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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|---|---|---|---|---|---|---|
| C  : **C**onceptualization | | I  : **I**nvestigation | | Vi : **Vi**sualization | |
| M : **M**ethodology | | R  : **R**esources | | Su : **Su**pervision | |
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## CONFLICT OF INTEREST STATEMENT

The authors affirm that there are no financial, personal, professional, or intellectual conflicts of interest that may have influenced the design, implementation, interpretation, or presentation of the findings in this manuscript. This includes the absence of any non-financial competing interests such as political, ideological, academic, or religious affiliations that could compromise the objectivity and integrity of the research. The authors declare no conflict of interest to this work.

**INFORMED CONSENT**

This study is a systematic literature review and does not involve human participants, personal data collection, or any procedures requiring informed consent. All data analysed were obtained from previously published studies that are publicly accessible and ethically approved by their respective authors and institutions.


**ETHICAL APPROVAL**

This study is a systematic literature review conducted following the PRISMA guidelines. It did not involve the collection of primary data from human participants or animals and therefore did not require ethical approval. All included studies were previously published, publicly available, and had obtained ethical clearance from their respective institutions, ensuring adherence to standard ethical research practices.


**DATA AVAILABILITY**

Data availability does not apply to this article as no new empirical data were generated or analysed during the study. This systematic literature review is based entirely on secondary data extracted from peer-reviewed journal articles indexed in Scopus and Web of Science (WoS), covering publications from 2020 to 2024. All data supporting the findings of this review are publicly accessible through these databases, and full bibliographic references are provided in the reference list of this article.

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