

Transformative Public Health Education

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Transformative public health education - are we there, yet?

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Editorial on the Special Issue
Transformative public health education - are we there, yet?

Introduction

The rapid evolution of public health challenges, including pandemics, climate change, and health inequities, requires a workforce that can adapt swiftly and continuously, along with a public health education system capable of training competent professionals.

The Special Issue of Public Health Reviews on *Transformative Public Health Education* [1] features 19 articles that inform public health educators and researchers about critical areas and trends in academic programming. The three main themes are: *Public health education and workforce development*, *Transformative and Inclusive approaches*, and *Innovation and policy in public health systems*.

Public health education and workforce development

Traditional educational models focus on early-career training; they must change to foster lifelong learning, ensuring that professionals remain equipped with the skills and knowledge necessary to address emerging challenges.

Transformative Public Health Education highlights several innovative strategies that integrate lifelong learning into workforce development. For example, virtual interactive training courses provide timely, flexible learning opportunities. Digital platforms ensure continuous engagement with new research, policies, and best practices [2].

Other learning approaches, such as flipped classrooms and problem-based learning, foster critical thinking and problem-solving skills. In European public health programs, these methods empower ownership of education, instilling habits of inquiry that extend beyond the classroom and into careers. This approach encourages a mindset of continuous improvement and knowledge acquisition.

Programs such as the Humphrey Fellowship further strengthen the link between education and practice, offering structured career pathways that combine academic training with mentorship and leadership development, underscoring the importance of ongoing professional growth and the integration of hands-on experience.

Lifelong learning, as defined by the European Commission and UNESCO, extends beyond formal education. It encompasses a range of intentional learning activities conducted throughout life to enhance knowledge, skills, and competencies. Lifelong learning involves both formal and informal learning in diverse settings, including workplaces, homes, and communities. It plays a key role in fostering an adaptable workforce capable of responding to dynamic public health challenges.

Transformative and inclusive approaches in public health

Public health education requires transformative and inclusive approaches that prioritize local contexts and engage diverse communities. A “grounded textual” framework blends grounded and contextual practices, focusing on regional needs while addressing universal health challenges with a deeper, more inclusive involvement of local populations in public health education, research, and policymaking. This approach goes beyond solely quantitative assessments to incorporate the rich social, cultural, and political contexts that influence health outcomes Nayar et al.

A significant example of this is the increasing involvement of people living with HIV/AIDS (PLWHA) in educational settings. PLWHA are now active contributors to public health curricula and interventions, fostering empathy, reducing stigma, and creating a more inclusive healthcare environment. Their lived experiences enrich public health education, ensuring its relevance and authenticity Namer et al.

Similarly, the World Federation of Public Health Associations (WFPHA) advocates for gender inclusivity in leadership. Despite comprising the majority of the healthcare workforce, women remain underrepresented in leadership roles. Addressing this disparity through mentorship and transparent recruitment can improve decision-making and policy development Abdalla et al.

The involvement of community health workers (CHWs) in both developed and developing countries illustrates the transformative potential of localized healthcare. CHWs bridge the gap between communities and healthcare systems, especially in maternal and child health, ensuring that vulnerable populations receive essential care Gupta and Khan.

Social prescribing has emerged as a transformative strategy in higher education. Centralized platforms, stigma-free services, and peer support are essential for engaging students in mental health and wellbeing initiatives. In this context, trained link workers or navigators, equipped with broad skills and local knowledge, are crucial Davies et al.

Finally, patient involvement in mental healthcare education is essential for developing inclusive and effective training programs. Engaging patients in educational processes takes a collaborative and holistic approach that highlights the importance of empathy and context-specific strategies [3].

These examples underscore the importance of fostering inclusion and involvement in public health, where diverse perspectives help shape the future of public health education globally.

Transformative Public Health Education: The value and impact of innovation for health systems

Innovative policies and public health systems provide significant tangible opportunities to enhance efficiency, equity, and health outcomes [4]. These achievements increase accessibility, improve resilience, and lower costs to foster sustainable solutions to public health challenges. Innovation in policymaking promotes and enables evidence-based decision-making, which, in turn, supports new ways of working and thinking sustainably at scale. Innovation also provides an opportunity to strengthen defenses and foster resilience against emerging health threats.

Effective policies create an enabling environment while safeguarding patient and client safety and public health. The translation of innovation into practice provides the opportunity to prioritize the reduction of health disparities and enhance access for vulnerable populations. Including stakeholders is a critical aspect of innovation and promotes effective collaboration between healthcare professionals, communities, public health organizations, and government agencies.

Technological advances affect many aspects of international health, aged and social care systems, supporting innovative ideas and practices such as telehealth, which improves healthcare accessibility and efficiency [5].

Investment and expenditure for healthcare sustainability are critical policy issues and are key to enabling cost-effective, efficient opportunities for the delivery of healthcare.

Another important issue is the dynamic of resistance to change [6]. Interoperability of processes is a critical mechanism for mitigating resistance to change. Technological, procedural, or policy-driven innovations are designed to be interoperable and reduce disruptions. This drives a culture of continuous improvement while maintaining operational stability.

Conclusion

Transformation in public health requires embedding lifelong learning into education and training systems to cultivate a workforce that is prepared and actively shaping the future of public health. Inclusivity, empathy, and context-specific strategies that prioritize the wellbeing of all communities are vital. Applying policies, innovations, technologies, and approaches to ensure quality healthcare is crucial to building a transformative workforce.

It is our sincere hope that schools and programs of public health will reflect on these trends and embrace the relevant recommendations.

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Towards “Groundtextual” Public Health: The Need for a Critical and Transformative Approach

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Keywords: groundtextual public health, theory, pedagogy, philosophy, public health challenges

INTRODUCTION

Public health theory, practice, and education that do not relate to the context become irrelevant. “Groundtextual” is a neologism of grounded and contextual public health which has both universalistic and particularistic elements in its package and should be capable of responding to local challenges. The purpose of this paper is to reflect on the current state of public health as it is a popular course in many universities and institutes. In any context, public health with a universalistic framework, strategy, or theory and methods needs to face the challenge of the diversities across regions and states. Experience in research with such diversities also prompts this paper as data from such different contexts make it a challenging task to develop uniform strategies. It is also extremely challenging because, in many instances, lack of data reduces public health to a “silent science.” Public health is now reduced to a data science. Especially, the prominence given to statistics, quantitative applications, and some broad theoretical notions means that scholars are unable to respond given the absence of reliable data on many infections except some easy-to-implement microanalyses. However, such prominence of quantification gives it an appearance of a universal science.

There exists an assumption among public health scholars, termed as a “laminar view,” which assumes that if one adopts a mechanical methodological approach similar to some of the normal sciences, it is possible to capture the phenomena consisting of issues related to health and health services in an uninterrupted flow. However, this is a myth as there are many conflicting spheres in public health especially when many social, cultural, and political contexts influence the phenomena. Most of the decision-making within the health services system is taken within the political sphere and is largely eminence-based because of the priorities and imperatives of the sphere itself. Such conflicts between the spheres and levels may not be revealed or may be captured only superficially in so-called mythicized and pedantic surveys and statistical research. The social sphere is also difficult to capture unless the researchers have unusually creative as well as responsive abilities. It is unrealistic to assume that any single study should or can investigate the entire gamut of the process and dynamics of the public health phenomena especially because of its complexity. The need for an *iterative* process which moves from simple level exploratory approaches to more complex and abstract constructions is to be recognized. But this is the missing link that gets lost in the present race for outputs which can be categorized as market-decided research, the so-called flourishing “knowledge market.”

This commentary is intended to reflect on these challenges and to create reflexive responses by the scholars in public health. This is especially important given the observation regarding the “silence of majority” of public health scholars to effectively intervene in or being cavalier of issues, both conceptually and practically in responding

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to many public health issues in the world including the pandemic, except for some mechanically executed research. Such silence has led to the dominance of self-appointed experts and/or eminence-based public health. This is indeed a complex issue as exposing the weaknesses with some clarity requires consistent dialogue, but let me begin my initial reflections by stating the many paradoxes in public health.

PHILOSOPHICAL PARADOXES

Public health has not gone beyond “the right to health” and ethics in its philosophical outlook. The current crisis has revealed and exposed many weaknesses of this outlook, notwithstanding its positivity. This outlook always emphasized the need for provision of care as the foremost issue which resulted in making services available and creating institutions. It also reaffirmed the statistical face of public health eclipsing other key determinants of the scenario. This reaffirmation, for instance, as in the case of the present pandemic, has been partial as it could only access some generally agreeable data while hiding the more important social determinants as well as data which could lead to political discomfort.

Evidently, public health philosophy is teleological and outcome-determined [1]. Therefore, it has a larger practical outlook because the discipline is assessed on the basis of what is achieved and in terms of the benefits that are accrued due to the actions. But over time, we see the development of a dominant magic bullet and vertical approach to health. However, politics play an important role in public health discourse and actions. The efforts to make it scientifically neutral only make it irrelevant. Most research papers published in journals end up ritualistically stating practical and policy implications of their data, and they are also assessed largely in terms of this rather than how they add up to the public health knowledge storehouse.

The philosophy has undergone some changes due to shifts in the larger macroeconomic scenarios in the world and the new ideological elements entering the public health discourse. But it has also brought the “radical skeptic” to the forefront who was not averse to data but skeptical of the extreme empiricism and positivism which engulfed public health and the so-called “ritualistic and set” patterns of data gathering. Such scholars, based on their critical wisdom, examined new initiatives. They tried to change the earlier approaches of health services which proclaimed them as a right, including statements like “health services to be provided at the doorstep of the people irrespective of paying capacity,” etc. However, already critically analyzed shifts such as insurance or privatization were not explicit but hybrid so that some acceptability could be generated gradually. The biggest weakness of this new practical philosophical outlook of public health is the assumption of universality and its disconnect with people and the social structure. It is in this context that a critical orientation is necessary for

conceptualizing transformative public health and a pedagogy appropriate for such public health.

CRITICAL THINKING AND QUALITATIVE-QUALITATIVE DIVIDE

It is easy to suggest the need for critical thinking in public health. However, it requires a clear road map and an in-depth understanding of ground level issues and their interrelationships. One of the issues which has almost taken over public health is the quantitative approach. However, the tension between quantitative and qualitative applications in public health is a perennial issue. The “number representations” become inadequate for public health while “exploring new ways in handling problems”; although there are possibilities of critical thinking even with a quantitative approach [2]. However, this is not realized by “quantitative disciplinarians.” The inadequacy is increasingly realized during the pandemic and it is time to update the existing repertoire of public health with an integrated holistic view which accepts a quantitative-qualitative synergy.

The absence of critical thinking also leads to inadequate problematization of issues despite some attempts at mechanically subscribing to a mixed method approach etc. while deciding the methodology. Many public health problems require careful problematization which means that health or ill-health have to be grounded and made relevant to the context. This has become increasingly applicable with respect to the present pandemic when the virus tends to act in different ways according to the context. Transformative public health and a pedagogy with such an orientation have to take into consideration such factors to make it relevant and useful.

PEDAGOGICAL PARADOXES

If you state in epidemiological language, it becomes apparent that the relationships between humans and disease-causing agents in public health science are much more complex than the present understanding. This complexity needs to be addressed starting with the pedagogy which still depends on its ancestral fields such as Tropical Medicine and Hygiene, Preventive and Social Medicine, and their new avatar Community Medicine. This complexity cannot only be addressed by the methodological armor, which public health mechanically uses mostly drawn from these lineage disciplines and some liberally drawn from social sciences including qualitative methodology. The mechanical approach may be an under representation when you examine the so-called syllabi of public health. It actually reflects the lack of real interest and non-investment of any commitment. It is not my view that this complexity is not realized by those who develop public health syllabi in various institutions, but in many cases, it is preached without any sincerity or sensitivity. The paradox in pedagogy arises due to the divide between theory and practice as the teachers themselves are not aware of the key dimensions and theoretical concepts which are needed to understand “health in society.” Fundamentally, the dominance of technique-driven training is due to this limitation. There is also a trend of “bureaucratic pedagogy” where finishing portions, set patterns of interactions, and routinization of research

are encouraged. Any interventions in the form of critical appraisals are looked down upon as serious violations within such a degraded academic culture.

A transformative approach cannot be addressed easily due to the limitations discussed in this commentary, but at least some steps could be taken to narrow the divide. It is now time to practice what has been preached regarding the complexity and generate a pedagogy which is “groundtextual” and which can respond to present-day public health challenges more effectively. Only then can public health overcome its silent status and take on the role of a transformative science.

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Joint Efforts Towards Capacity Building in International and Global Health

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Academic capacity building of health personnel in international and global health, based on scientific evidence, is one of the pillars of the global strategy on human resources for health (HRH) [1]. Academic partnerships often focus on supporting institutions in single low-and middle-income countries (LMIC), successfully shown with the large-scale program for Rwanda [2], or establishing a multidisciplinary, international PhD network for training future researchers in Africa [3].

With the aim to establish a transnational Master program in Global/International Health, tropEd, an international training network exists since 25 years. With an initial funding under the umbrella of the European Erasmus program und exclusively with European universities as members, the network rapidly increased the number of members of non-European universities. Today the network—formally an association under German law since 2003—consists of 27 institutions of higher education from Africa, Asia, Europe and Latin America¹. Whereas in the first years the mobility of students and teaching staff was prioritised, nowadays the exchange of experiences, a common standard of education in global health, and the quality assurance of teaching offers are in the focus.

Reflecting on the 25th anniversary of the network, the history of tropEd gives an excellent example, that long-term partnerships and collaborations of dedicated individuals and institutions are the key for successfully contributing to capacity building on the individual, but also at the institutional level. Students completing a Master's program at one of the member institutions value the new knowledge and skills acquired as essential and for many of them the program laid the ground for job promotion [4]. In addition, the majority of students from LMICs remains in their country of origin after graduation, supporting their health systems in the daily fight against manifold challenges.

As students register at one of the member universities, but can take courses at any member institution, the quality assurance of offered courses is seen as one major task of the network. tropEd does not deliver the Master degree itself, therefore the network defined a framework with common minimum academic and quality assurance structures, content and criteria [5]. The national accredited degree of the respective member university must adhere to these standards to be recognized as a “tropEd Master in International Health” [5]. In addition, such a tropEd recognition will be delivered to a student only, if she/he took at least courses worth ten ECTS credit points outside the home institution.

As a first step of the institutional quality assurance, institutions applying for membership have to undergo a formalized self-evaluation, followed by a site visit of a member of tropEd's Executive Committee, including discussions with students, staff and management of the applying institution;

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¹<https://troped.org/member-institutions-3/>.

the final decision on admission is done by the General Assembly. The offered Master program has to be offered in a modular format, consisting of a core course, advanced modules and a Master thesis. Core course and advanced modules have to be submitted to the General assembly in a standardized format, and will be peer-evaluated and accredited for a maximum of 5 years; after this period courses have to be re-submitted and re-accredited. Only courses, which are accredited by tropEd, can be taken by the students. This strictly implemented peer-review process of courses is the only practical measure for guaranteeing the quality of course offers, as no accreditation agency for a worldwide transnational higher education network exists [5]. Although this quality assurance measure means an additional burden for the member institutions, it has proven its validity over the past 25 years.

Currently the SARS-CoV-2 pandemic forces the next challenges to tropEd: mobility of students and teachers was heavily restricted in the past 2 years, and national regulations often did not allow onsite teaching—as most of the universities worldwide also tropEd members have to change the mode of delivery of courses to an online or hybrid format. Online teaching

does need different pedagogical approaches [6], what has to be taken into account into the quality assurance of the offered courses. Furthermore, tropEd will have to support as a network the efforts of decolonizing International and Global Health training [7], by increasing the number of member institutions from the global South, but also by a bigger share of courses offered from institutions from LMIC.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

CONFLICT OF INTEREST

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Public Health Workforce Development Through Virtually Interactive Training Courses

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Keywords: public health workforce development, public health training courses, public health education, virtual interactive training courses, workforce development, transformative public health education

INTRODUCTION

One of the main lessons of the COVID-19 pandemic that can be drawn is that the health professional's education system needs significant revitalisation, especially public health [1]. Public health education and training need a more comprehensive and unique approach to equip its learner's key concepts through the competencies required for each level of public health practice [2]. In the fourth industrial revolution era, public health professionals need to be part of a new generation of professionals equipped with new skills and appropriate attributes to understand better and serve the population [3]. We developed some bespoke virtual interactive courses that are crucial in training the public health workforce over the past 12 months. These training courses are tailored according to the target audience and the corresponding competencies needed to fill a noticeable gap in the field [4].

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PUBLIC HEALTH WORKFORCE

In addressing the above aim, we looked at the ten public health functions and how we can link a set of competencies for each function and assess each competency's suitability for the target group. Then, the number of competencies needed for each course was identified through a linkage process to the learning objectives. We reached to as many possible stakeholders who identified their selves as involved in public health delivery directly or indirectly, guided by the Public Health England scoping exercise on the public health workforce [5].

We identified the need for an appropriate learning model to be chosen for each course. A learning model, in this context, is a structured content of learning materials presented together. It supports a course concept or theme, goal, learning objectives and topic(s). The essential components of a learning model are the analysis of the situational factors [6]. This gave us information about the target trainees and the expectations from the organisation, formulating the learning goals and objectives of a course that allows the course leader and trainee to evaluate the progress throughout the sessions.

The key element is the selection of the training activities that help choose the appropriate methods of training depending on the content of the course given. While a course leader sets the scope, learners can negotiate a learning method to suit their learning styles and explore the contents in any order and at their own pace. A model that serves its purpose successfully has been developed around the needs of the trainees. These innovative approaches were well received by the trainees.

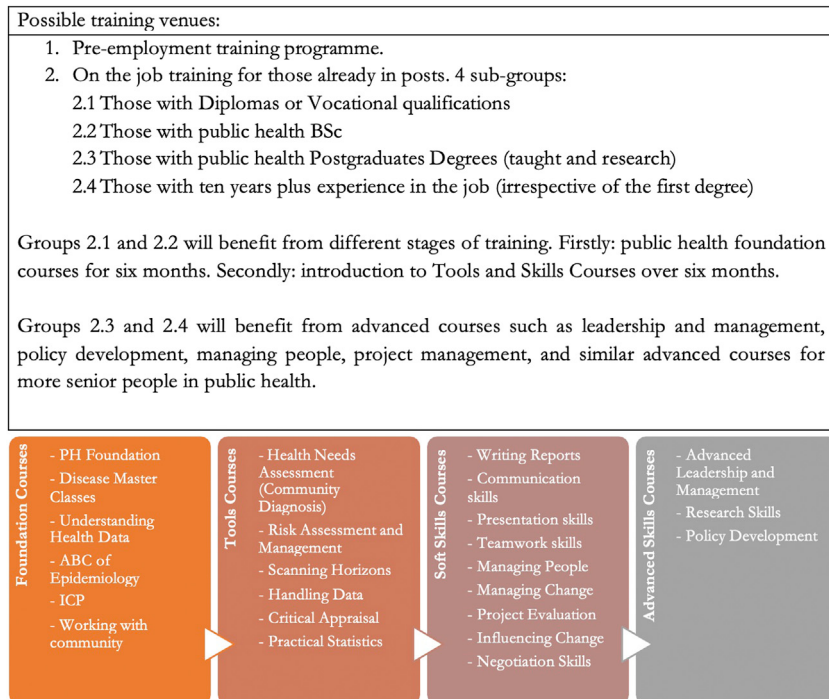


FIGURE 1 | Table explaining the different venues for public health workforce training and a list of different types of public health training courses (United Kingdom, 2020).

TARGET GROUPS

Three different potential target groups of the public health workforce were identified. First group is the “Wider Public Health Workforce”: An individual who is not a practitioner or specialist in public health but can positively influence health and wellbeing through their work. This workforce group comprises individuals across a range of sectors, within and outside the health sector. Second group is the “Public Health Practitioners”: They are the core public health workforce who work in various areas of public health, including health improvement, protection, and public health healthcare. Also, in public (service and academic), private, voluntary, and community sectors that contribute to public health outcomes and improve health and wellbeing. Third group is the “Specialists (Consultants) in Public Health” the highest level of the public health workforce. Those described as specialists are medical and non-medical graduates who completed their higher specialists training in public health or preventive medicine for 4–5 years in a well-defined and structured training programme.

This classification of the public health workforce helped design the courses, target audiences, and competencies needed to bridge the gaps through these innovative training methods.

PHASING OUT

A “Phase Out” is to denote the actions taken to equip those who are currently employed within public health delivery without

public health background, should obtain the accredited training in public health to deliver services based on the science and art of promoting health, preventing disease, and prolonging life through the organised efforts of society [7].

All stakeholders involved in public health delivery, directly or indirectly, would welcome such an opportunity to improve the quality of their workforce. This could be achieved through various venues, as outlined in **Figure 1**. The phase-out process must be guided by a “national public health workforce strategy”. Such a strategy should guide how the future public health workforce’s needs are addressed.

BRIDGING THE TRAINING GAPS

Based on the ten public health functions, the competencies needed, and gaps identified in the training of groups below consultant level, i.e., those who did not complete a structured training programme over 4–5 years, four types of training courses were identified (**Figure 1**). Public health foundation courses are designed for those who did not have any education in public health; public health tools courses for all three levels; soft skills courses for all; and advanced skills courses for practitioners and specialists (consultants). These two groups could benefit from joint bespoke design and delivery such as data management, research, and development, policy based on evidence, and health need and impact assessment.

Each course planned for delivery should define the competencies that the course will address. The number of

competencies needed for each course must be linked to the learning objectives of the course and the target group.

Candidates joining the training courses should accumulate the most significant number of relevant competencies and be assessed accordingly. It is expected that those aspiring to “specialist” (level 3) should meet 100% of the competencies listed; those for level 2 should achieve 70–75% of the competencies, and those in level 1 (the wider public health workforce) should earn 50% of the competencies. Each candidate will have an electronic logbook to bank the competencies achieved and score the level reached.

Conclusion

We started these courses virtually; however, this framework should continue into hybrid and physical teaching. This systematic way of identifying the needed skills and what is missing from the public health workforce should be used for future public health education and training courses to develop the

appropriate learning platform to fulfil the needed competencies and requirements for a well-functioning and full accredited public health system the people can trust.

AUTHOR CONTRIBUTIONS

SR: Main ideas and development of the plan on how to make the public health training program work in a virtual setting. CT: Expansion of the ideas and linking them to the curriculums and training courses available.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Transformative Encounters: A Narrative Review of Involving People Living With HIV/AIDS in Public Health Teaching

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Objectives: To collate the experiences of involvement of people living with HIV/AIDS (PLWHA) in academic public health teaching to inform future public health education models involving people affected by long-term effects of other pandemics. Our goal is to describe interventions in a way that makes them accessible to potential public health teachers hoping to adapt patient involvement paradigms in their teaching of chronic illness brought on by infectious diseases.

Methods: Narrative review based on a literature search in PubMed and Google Scholar up to September 2021. Fifteen articles that contained a description of a health educational intervention on HIV/AIDS that actively involved PLWHA were included.

Results: Interventions either involved PLWHA as teachers and program/curriculum developers or incorporated experiential elements in which students have genuine contact with PLWHA. Creating safe spaces, recognizing PLWHA as experts, relating to each other differently were common transformative elements.

Conclusion: Involving PLWHA in public health teaching have transformative and empowering outcomes, both for PLWHA and for learners. This finding should inform new teaching programs that will address the long-term effects of other pandemics such as COVID-19.

Keywords: narrative review, public health education, HIV/AIDS, patient involvement, PLWHA

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INTRODUCTION

For many communities, the COVID-19 pandemic has been the largest and most intrusive health emergency that they encountered. It was the first time that their social relationships have been subjected to rules and regulations, the distance between each other has been surveilled, and forms of social contact became a threat. For many, it was the first time they lost friends and family members on such a scale. However, none of this was new for communities whose lives were impacted by the HIV pandemic, which has been with us for 40 years, affecting an estimated 38 million people worldwide (1).

The similarities and differences between the HIV and COVID-19 pandemics are increasingly becoming part of the scientific discourse. Although the routes of transmission are different, the disproportionality of marginalized communities being affected, the stigma-related barriers to social

participation, the necessity of stigma reduction to tackle misinformation and to promote prevention are argued to be the similarities between the two pandemics (2–4). Moreover, the initial denial of the severity of both infectious diseases by some scientists, health care professionals and affected communities alike, shadowed by stark panic by the public that targeted certain communities followed a similar narrative in both pandemics (5). Patient activism is another similarity: both in the cases of living with HIV and living with Long COVID there were (and still are) “epistemic authority” struggles, with especially people from marginalized communities fighting to get their lived experience recognized as expert knowledge (6).

Such discussions surrounding pandemic preparedness in response to COVID-19 made it apparent that communities’ knowledge of surviving HIV/AIDS has not been adopted by the larger society (7) and is underutilized by scientists and health professionals (8). We believe that the lack of knowledge transfer also applies to the experiences of community involvement in medical and public health teaching. In other words, paradigms of patient involvement have not been adopted widely enough to allow future health professionals the opportunity to learn from lived experience.

Patient Involvement in Teaching

Patient involvement, or inclusion of people with lived experience of illness in teaching is a component of knowledge transfer that adds significant value to medical and public health education. Patients are experts in their own experience of living with certain health issues (9). They provide expert advice regarding symptom management or coping with the consequences of ill health. They also demonstrate that health problems manifest in unique and heterogeneous ways (10). Patients embody the social determinants of health and illustrate a larger picture of living with a health condition, especially in the cases of chronic illness (11). Contacts with patients thus challenge long-held attitudes and dispel myths about health conditions (12, 13). Despite its value being recognized, there is yet to be wide and systematic adoption of patient involvement in medical and public health teaching (14).

Towle and Godolphin (15) identified three guiding principles of patient involvement in teaching. First, patients possess knowledge by experience that cannot be taught by faculty. Second, power relations should be balanced to ensure authentic participation of patients. Third, patients should have the say in what, how and where they teach. Towle et al. (11) further developed levels of involvement from minimal involvement to high: 1) patient as case study or scenario, 2) patient as volunteer in a scripted clinical encounter, 3) patient sharing experience in faculty-shaped framework, 4) patient assuming the role of teacher or evaluator of student performance, 5) patient as equal partner in curriculum development, and 6) patient holding sustainable institutional membership. A recent review of patient involvement in undergraduate medical education found that patients most commonly take the role of teacher, and with slightly less frequency the roles of assessor, curriculum developer, and student selection committee member in active involvement

paradigms (14). In other words, interventions increasingly adopt elements of levels 4 to 6 of Towle et al. framework.

Patient involvement in teaching can be based on different principles depending on the health condition. The Greater Involvement of People Living with HIV (GIPA) is a “principle that aims to realize the rights and responsibilities of people living with HIV, including their right to self-determination and participation in decision-making processes that affect their lives” (16). PLWHA should therefore be included in the educative processes that go into building a health care workforce providing respectful, equitable, dignified health care. Although the GIPA as well as the practices and pedagogies of patient involvement in teaching have existed for decades and were adapted to the teaching of the HIV pandemic, they have not become core components of medical and public health teaching. PLWHA have identified “weak management, low skill levels, funding constraints, difficulties in representing the diversity of people living with HIV, a lack of documentation of their histories of self-empowerment and a lack of evaluation of successes and failures” as barriers to upholding the GIPA (16). It is possible to argue that similar reasons have obstructed the meaningful involvement of PLWHA in public health teaching.

The aim of this review is therefore to collate the experiences of involvement of PLWHA in teaching to inform future public health education models involving people affected by long-term effects of other pandemics. Our goal is to describe interventions in a way that make them accessible to potential public health teachers hoping to employ patient involvement models in their teaching of chronic illness brought on by infectious disease. We present different forms of involving PLWHA in teaching and assemble the lessons learned from these interventions. We then discuss the possibility of patient involvement for a resilient and transformative public health education post-COVID.

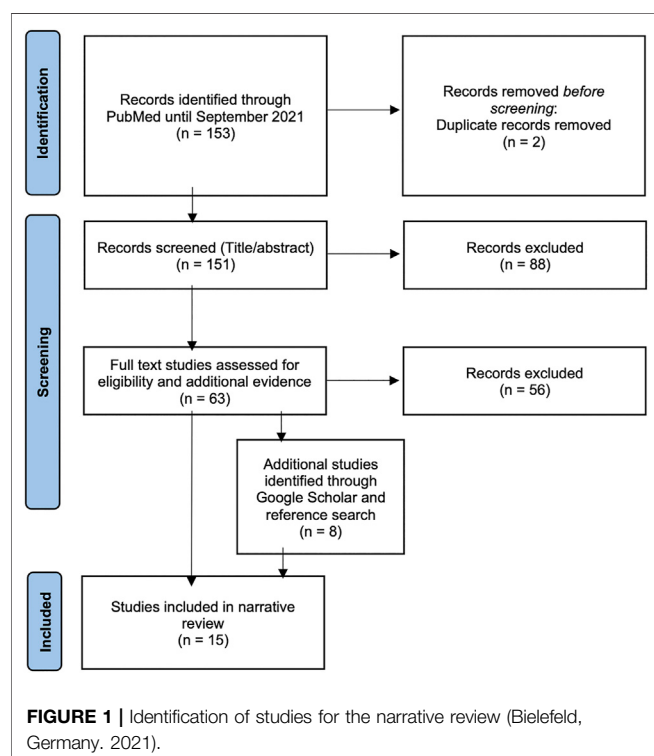
METHODS

To identify studies for this narrative review we performed a literature search in PubMed and Google Scholar including papers published up to September 2021 using variations and combinations of the search terms: HIV, AIDS, medical education, public health education, continuing education, professional development, community, resilience, survivorship and involvement. The search strategy was developed through an iterative process by trying different permutations of search terms. There were no restrictions in terms of year of publication, but the search language was limited to English. Our final search in PubMed with the following keywords revealed 153 results:

“HIV”[Title/Abstract] OR “AIDS”[Title/Abstract] OR “HIV/AIDS”[Title/Abstract]) AND (“medical education”[Title/Abstract] OR “public health education”[Title/Abstract] OR “continuing education”[Title/Abstract] OR “professional development”[Title/Abstract] OR “medical curriculum”[Title/Abstract]) AND (“community”[Title/

TABLE 1 | Inclusion and exclusion criteria for the literature search.

Inclusion criteria	Exclusion criteria
• The article included a description of a health educational intervention on HIV/AIDS. • The education intervention actively involved PLWHA. • The article was published in a peer-reviewed journal.	• The experience of living with HIV/AIDS is not central (e.g., only used as an example). • The education intervention is not in the health sciences. • Grey literature or non-peer-reviewed scientific publications.



Abstract] OR “survivor”[Title/Abstract] OR “resilience”[Title/Abstract] OR “involvement”[Title/Abstract])

All peer-reviewed publications were screened by title and abstract by YN and FD in the first round and by full text in the second round according to the inclusion and exclusion criteria presented in **Table 1**.

Additional studies were retrieved by screening the references within the relevant articles by YN and FD. Although our aim is to draw conclusions for public health education, we included literature on medical, nursing and other health education as well to capture the few published experiences of PLWHA involvement. A total of 15 articles were included in the review. The selection process is displayed in **Figure 1** (adapted from (17)).

RESULTS

In response to the emergence of HIV/AIDS, the first articles discussing the teaching of HIV date from the early 1990s. These studies were a response to the myths surrounding the then-AIDS

epidemic and the fears and reservations they instilled. More teaching interventions seem to have emerged in the second decade of the pandemic, with a decline in the third decade, and another increase in the fourth decade.

We discuss the interventions in detail to give a vivid picture of how PLWHA were involved in teaching. We organize the results in three categories: incorporating experiential elements in which students have genuine contact with PLWHA (level 3 of involvement) or interventions involving PLWHA as teachers/instructors/educators (level 4 of involvement) and as program/curriculum developers (level 5 of involvement) (11). An overview of findings is presented in **Table 2**.

Experiential Modules Incorporating Genuine Contact With PLWHA (Level 3)

The earlier teaching interventions created opportunities for students to have contact with PLWHA in a meaningful way. The first study that incorporated organic contact with PLWHA into teaching came from the first decade of the epidemic and the field of community mental health (18). Following an introduction on the relationship between community mental health and living with HIV/AIDS, Knox et al. introduced experiential components involving PLWHA in clinical tutorials in three modalities. First, the tutorial participants attended a panel presentation by a support group for PLWHA with mental health-related histories. Second, they attended the support groups themselves, either aimed at people living with HIV, people living with AIDS, or their loved ones. Third, they joined community network meetings of HIV health care providers and agencies prioritizing mutual support. A subsequent quantitative evaluation of this clinical tutorial demonstrated increases in knowledge, and decreases in fear, discomfort and avoidance related to HIV (19).

The next study involved the PLWHA perspective within an artistic framework (20). In this study by Shapiro and Hunt, medical students attended an hour-long theatrical performance based on the performer’s lived experience of HIV as part of a course module. The performance involved storytelling through songs the performer wrote about his life as a PLWHA. The audience was heterogenous, made up of physicians, students, other PLWHA, their family members and community health workers. The performance was followed by a panel discussion of physicians, scholars and the performer with the audience and then an informal gathering. In an informal evaluation the attendees reported different reactions. PLWHA audience members felt their experiences mirrored. Physician faculty stated identifying with the patient in the performance and thus gaining new insights about the PLWHA perspective. The

TABLE 2 | Overview of findings.

Level of involvement (Towle et al. 2010)	Study	PLWHA involvement in teaching intervention	Learners	Evaluation
Level 3	(18, 19)	Participants (1) attended panel presentation by a support group for PLWHA, (2) attended support groups, and (3) joined community network meetings of HIV health care providers	Community mental health professionals	Learners: increase in knowledge, and decrease in fear, discomfort and avoidance related to HIV
Level 3	(20)	Participants attended theatrical performance based on the performers' lived experience of HIV	Medical students and physician faculty	PLWHA: felt their experiences mirrored Learners: gained new insights about the PLWHA perspective, seeing a PLWHA as a full person rather than reduced to a diagnosis
Level 4	(21)	Experiential sessions in which PLWHA told their stories and shared their clinical skills	Medical students	PLWHA: empowered in their roles as teachers Learners: improved their relationships with their patients and made them more open to discuss their own fears and anxieties
Level 4	(22, 23)	PLWHA as "resource tutors" facilitating reflective spaces	Nursing, social work, occupational therapy, physiotherapy students and family medicine residents	PLWHA: empowered, discovered new aspects of self, found purpose in teaching, change in experience of HIV Learners: confronted their assumptions about HIV, accepted PLWHA as knowledge sources into their experience, learning new ways of communication
Level 4	(24)	PLWHA facilitated body mapping workshops	Nursing students	Collective: connection, trust, commitment to fight stigma and demand social justice for shared lives PLWHA: validation of experience, giving back to community Learner: change in attitudes, moved from initial ignorance to future commitment to HIV advocacy
Level 5	(12, 26)	PLWHA formally employed as primary faculty developing the teaching materials on HIV/AIDS as well as assuming the teacher role	Medical students/trainees, health care professionals (e.g., nurses, social workers, dentists, physicians, psychologists)	PLWHA faculty: change in motivation over time, from personal reasons (e.g., financial) to relational reasons (e.g., effecting change for others), empowered, took agency in their HIV experience, found a support network within the program Learners: focus on the similarities of PLWHA and their own lives
Level 5	(27–29)	PLWHA co-developed program and facilitated discussions on their lived experience and co-created a simulated clinical encounter (SCE) intervention and delivered it as patient instructors	Medical students	PLWHA: empowered, felt respected as experts, found a safe space to relive experiences Learners: reduction in HIV-related stigma, increase in the willingness to deliver HIV care
Level 5	(30)	PLWHA co-created a narrative medicine curriculum	Medical students	Collective: relationships based on reciprocity and a sense of community PLWHA: felt their contribution to medical education meaningful Learners: found meaning in contributing to the PLWHA's wellbeing
(elements of) Level 5	(32)	Consultation in curriculum development	Community-based paraprofessionals	—
(elements of) Level 5	(33)	PLWHA engaged in photo elicitation and photovoice to create materials for teaching purposes	Dental care students and professionals	—

student attendees appreciated learning about the HIV experience without the element of providing patient care. Students further favored watching how doctors were portrayed in the performance and seeing a PLWHA as a full person rather than reduced to a diagnosis.

Inviting PLWHA as Teachers (Level 4)

The first study we found that exemplified inviting PLWHA as teachers was by Vail et al. (21). The intervention invited support group-attending PLWHA (who therefore have the experience of sharing their stories) to join a minicourse for medical students. The preparation for PLWHA comprised a discussion on the clinical skills and attitudes required to care for PLWHA and a workshop with a medical student to practice giving feedback to students. The resulting minicourse incorporated lectures on the epidemiology of HIV by faculty followed by experiential sessions in which PLWHA told their stories. The narratives spanned from disclosures to loved ones to anxieties and fears about dying. In the next phase, PLWHA participants were paired with students, practiced clinical skills one-on-one and provided feedback on students' performance. The minicourse evaluations revealed that this involvement benefited both parties immensely: PLWHA felt empowered in their roles as teachers and students were deeply and positively changed by the experience in a way that improved their relationships with their patients and made them more open to discuss their own fears and anxieties.

A second group of studies by Solomon et al. involved PLWHA as "resource tutors" in small-group problem-based tutorials (22, 23). This model recruited PLWHA who either already had experience working with small groups (22) or received relevant training to do so (23). Faculty tutors undertook the facilitation of tutorial sessions while the resource tutors created the reflective spaces for the students to discuss different care-related problems. There were also opportunities for role-playing care scenarios with resource tutors (22, 23). In the qualitative evaluation based on reflective journal entries and interviews, it was apparent that the tutorial encounters allowed the students to confront their assumptions about HIV and accept PLWHA as knowledge sources into their experience (22). Resource tutors were already highly motivated to help future health care professionals, to learn how to teach and to discover new parts of themselves when they joined the teaching project. Some reported initial uneasiness with sharing their experiences. As the sessions progressed, however, resource tutors gained more confidence and adapted their teaching styles to incorporate more creative techniques to convey their lived experience (23).

A third study involved PLWHA in facilitating body mapping workshops in collaboration with a community HIV organization (24). The body mapping method emerged out of community work with PLWHA and comprises creating large body-size paintings that tell the story of the painter's physical as well as socio-emotional experience of living with HIV (25). In this study, Maina et al. used it as part of a community nursing course. PLWHA facilitators led the workshops in which the students created group body maps and observed the body maps of PLWHA. A post-mapping session held with the course professor, a PLWHA facilitator, a community

organization facilitator and a student highlighted the importance of being vulnerable in the teaching space, and the responsibility of the course facilitators to deem the teaching space safe. It also demonstrated how sharing one's bodily vulnerabilities and life stories allowed people to connect to and trust each other. The validation of each other's stories further generated the commitment to fight stigma and demand social justice for their shared lives. The exercise was especially transformative for the student, who reported moving from initial ignorance to future commitment to HIV advocacy through the workshop.

Inviting PLWHA as Program/Curriculum Developers (Level 5)

The first group of work that described an approach involving patients as comprehensive program developers also critically reflected on the experience. The outcome thus became seminal papers on working with PLWHA as faculty members. Hatem et al. (26) expanded on Vail et al.'s model (21) and formally employed PLWHA as primary faculty developing the teaching materials on HIV/AIDS as well as assuming the teacher role. The preparation was extensive and cumulative: PLWHA faculty first audited a program, and once recruited received orientation and attended programs taught by fellow PLWHA faculty. Formal training in program development and teaching followed the decision to commit to the program. The co-developed programs included panel discussions, small group teaching or small group discussion facilitation. PLWHA faculty were debriefed, regularly monitored for burnout and checked up on during their time off by non-PLWHA faculty (26). A report on the learners' experience of an earlier version of this teaching approach showed that involving PLWHA allowed learners to focus on the similarities of PLWHA and their own lives (12). A qualitative evaluation with the PLWHA faculty revealed a change in motivation over time, from personal reasons (e.g., financial) to relational reasons (e.g., effecting change for others). The PLWHA faculty reported feelings of empowerment, a sense of mutual understanding and taking agency in their HIV experience (26).

The second group of work involved PLWHA in curriculum development in a participatory way. In the first study, Chew et al., most of whom were medical students at the time, consulted with PLWHA and community HIV organizations in addition to medical students and HIV care physicians to develop a medical student-initiated extracurricular HIV elective course (27). The course incorporated discussion sessions led by PLWHA on their lived experience of HIV and visits to community care organizations. Building on their previous work, the team further co-created a simulated clinical encounter (SCE) intervention together with PLWHA who then delivered it as patient instructors (28, 29). The intervention involved HIV testing and pre- and post-test counseling encounters with two scenarios: a negative and a positive test result. The PLWHA instructors acted as the patient in SCEs with medical students, provided the majority of the feedback in the post-SCE sessions and were available for questions. The evaluations revealed that the PLWHA found

their role in medical training meaningful and empowering. They felt that the intervention was a safe space where they felt respected and seen as experts. Both groups thought the intervention was realistic and feasible, and contributed to student skill-building (28). The intervention also reduced HIV-related stigma in medical students and increased the willingness to deliver HIV care (29).

One other participatory study involved a narrative medicine curriculum (30). Narrative medicine as a model examines different narrative situations in medicine and incorporates narrative practices such as close reading of texts and reflexive writing (31). In this “community-based participatory narrative medicine” study, Chou et al. involved preclinical medical students and patients receiving care in a clinic which typically serves PLWHA, although they did not require participants to reveal their HIV status (30). The intervention contained participants’ narrative writing which happened outside of sessions, close reading of texts selected by the facilitators based on participants’ diverse backgrounds, in-session writing based on prompts, and workshopping participants’ writing. Evaluations shaped by observations, participant feedback, focus groups and the narratives themselves showed that this intervention allowed participants to build relationships based on reciprocity and a sense of community. Both groups found a safe space where they helped each other reflect on their own and each other’s lives by sharing their writing. PLWHA felt their contribution to medical education meaningful and medical students similarly found meaning in contributing to the PLWHA’s wellbeing. Both groups remarked that the relationships they built through this intervention were unlike typical patient-medical student relationship.

Two studies further involved PLWHA in teaching material development in various ways. In developing a program aimed at community-based paraprofessionals, Poindexter et al. held focus groups with stakeholders, including PLWHA who have received services, to identify what skills people working in the field of HIV should possess (32). Although PLWHA were not involved in the drafting of the curriculum per se, they were consulted in the development process. Another study involved PLWHA more intensely in teaching material development for dental care students and professionals (33). In a grounded-theory action research, Schrader et al. invited PLWHA to engage in photo elicitation and photovoice and to keep reflective journals in order to visually represent their lived experiences. By creating photographs of important places or people in their lives, different community-oriented action themes emerged to contextualize PLWHA’s daily lives, such as recovery tools, social support and medications. At the end of the study, researchers created multimedia narrative posters for each meta-theme featuring the participants’ photos to be used for teaching purposes.

DISCUSSION

This narrative review collated experiences of involving PLWHA in teaching at various levels of involvement. The evaluations, taken together, suggest that involvement of PLWHA leads to a

meaningful encounter of teaching and learning. We first discuss the elements that were transformative for both PLWHA and learners and the challenges of involving PLWHA in teaching. Following the limitations of this review, we discuss how these insights could be utilized in involving people with other chronic infectious diseases and what this could mean for the future of public health education.

Transformative Elements

Most of the papers we reviewed reflected on the intervention as a whole and shared the lessons they learned through running or facilitating the intervention. It was evident that the authors were inspired by creating a space for PLWHA and students to have a meaningful connection. The importance of creating a safe space before, during or following the teaching of the course was continuously underlined (21, 24, 28, 30). Some education interventions worked well because the PLWHA participants belonged to the same support group, which was a chosen family substitute for many PLWHA at the time (18, 19, 21). Support group members already possessed the experience of self-reflection as well as creating a reflective space for each other. Empowerment of PLWHA through meaningful contribution to education and being recognized as experts was a common and key transformative thread in most of the interventions (21–23, 26, 28). PLWHA felt empowered in their roles as teachers. Learners were deeply and positively changed by the experience in a way that improved their relationships with their (potential) patients and made them more open to discuss their own fears and anxieties.

Some education interventions were believed to be successful as the duration of the program allowed the PLWHA and students to form a meaningful relationship (21, 22, 30). Sustainability was further critical: some interventions expanded in content and scope and even increased the degree of participation as they were allowed to progress (19, 23, 27). The theatrical intervention was argued to be transformative due to the heterogeneity of the audience, the informality of the post-performance gathering and the liveness of the intervention, which increased the richness of the experience for the students (20). The interventions’ focus on the similarity between people was a significant transformative element (12, 20, 24, 30). Close bonds between participants were achieved through shared work, lack of salience of patient/medical roles in the intervention and a joint reimagination of the health care relationship (21, 24, 30). Experiencing a different way of relating to each other was another common transformative element (21, 24, 28, 30). Learners had an enhanced experience when the goals were clear for everyone involved, and when there was space and time to process their learning experience (12).

Challenges

Although transformative, involving PLWHA brought with it a number of challenges. In the earlier years of the HIV pandemic, being open about HIV status meant loss of other employment for some PLWHA faculty (26). Their role exposed them to others’ negative attitudes (22, 23,

26). The PLWHA faculty's role further necessitated negotiating their own mortality, grief and that of fellow faculty (21, 26). In the studies conducted relatively early in the HIV/AIDS pandemic, before the development of more effective therapies, the PLWHA faculty became ill with time. Involving PLWHA faculty then also meant making space for death and mortality-related issues. Progression of illness impacted teaching styles and created differences of interpretation of teaching approaches between PLWHA and non-PLWHA faculty (26).

Negotiating negative emotions was another challenge (22–24, 28). The simulated clinical encounter, for example, triggered negative memories of the PLWHA instructors' own test encounter. Some studies further reflected on the time and energy required of the PLWHA facilitators to create a safe space for participants to explore participants' vulnerabilities while their own vulnerabilities are also exposed (24). Yet the risk of re-traumatization by revisiting past experiences also came with the possibility of healing (24, 28). Challenges included the logistical issues of attracting audience members or participants to an extracurricular event. Scheduling was a difficulty in some studies: medical students' schedules did not always allow participation in extracurricular events (20) and a similar problem ensued with community schedules in organizing community-based events (27). Communication was also reported as a challenge. In one group of studies, the students found it difficult to use the correct terminology in referring to the PLWHA experience, whereas PLWHA had difficulty with medical terminology used in the sessions which focused on parts of people rather than people as a whole (22, 23).

Several recommendations were made to remedy these challenges. Accepting the PLWHA experience as primary in differences of interpretation was a core recommendation (26). For logistical challenges, suggestions included partnering with student and community organizations to ensure attendance (20, 27). In the case of re-traumatization risk, training, debriefing as well as the availability of an on-site counselor were recommended (28). Other challenges also elicited the recommendation of additional training for PLWHA tutors in the cases where training would indicate overcoming of role-related anxieties (23). This recommendation came with a dilemma: as PLWHA were considered experts in their experience they weren't always provided with additional training in HIV. However sometimes this created the risk of students evaluating the tutorials as somewhat incomplete (23). Clear communication of initial goals were argued to prevent some of the training-related challenges (12, 23, 26).

Limitations of This Review

A core limitation of this review is the scope of the literature surveyed. We performed searches only on PubMed and Google Scholar and scanned and selected peer-reviewed journal articles. We realize that many such teaching interventions may not have been published in scientific journals but rather described in faculty newsletters, society meetings, or reports by community

organizations. It is also possible that interventions were developed as part of graduate work, outlined in theses or dissertations, or in non-academic settings such as civil society initiatives. We acknowledge that we only reviewed part of the knowledge produced in PLWHA involvement in teaching. We further recognize that a narrative review is a less systematic approach to reviewing the available evidence. However, we provide a snapshot of what knowledge is immediately available to academic faculty members within knowledge sources accessible to future public health teachers.

Recommendations and Implications for a Transformative Public Health Education

The results of this narrative review have several implications for the future of public health education. The aftermath of COVID-19 will have significant ramifications in terms of new chronic illnesses on a global scale and there is an increasing need to understand the lived experiences of new chronic conditions such as Long COVID. Although principles of involvement are yet to be developed for people living with Long COVID, many patient groups, including doctors who experience Long COVID, have published calls for recognition (34–36). These calls range from data generation on persisting symptoms of COVID-19 ("count Long COVID") to acknowledging the experiences of people who managed their symptoms in isolation without a diagnosis but now need rehabilitative care. The common thread is the demand of patient involvement in policy and research. Based on the experience on involving PLWHA in teaching, we extend the call to involve people living with Long COVID and other potential chronic illnesses in public health education.

First of all, people with persisting post-infection symptoms should be recognized as experts and actively involved in public health teaching, evaluation and curriculum development, with the aspiration of sustainable membership in schools of public health, with equitable compensation. The latter could take the form of building permanent yet dynamic community advisory boards which inform student selection, program evaluation and educational agenda setting. Second, people with lived experience assuming such roles should be fully supported to prevent re-traumatization or burnout triggered by sharing or re-living of their experiences. This would necessitate creating equitable and safe spaces, opportunities to reflect on the teaching experience, monitoring for burnout and securing paid leave when signs of burnout are evident. Third, the focus should be on relational aspects of teaching. This means that sufficient time is allowed for students, faculty members with and without lived experience to spend time together in formal and informal settings to get to learn from each other. Fourth, when challenges, disagreements or differences in interpretation arise, the lived experience of living with chronic conditions should be recognized as primary.

In conclusion, the decades-long yet sparse experience of involving PLWHA should be recollected to inform the new teaching initiatives that parallel the emergence of new chronic conditions. Involving PLWHA has been shown to be transformative and empowering for all parties, with unique

challenges spanning from logistical to relational. Future studies should explore the exact means necessary (e.g., management, funding, pedagogical training) to ensure sustainability of involving lived experience in a transformative way.

AUTHOR CONTRIBUTIONS

OR and YN shaped the research question. YN was responsible for the design and conceptualisation of the review. FD significantly contributed to the conceptualisation. YN and FD conducted the search and screening. YN drafted the initial manuscript. OR and FD revised the manuscript for intellectual content. All authors read and approved the final version of the manuscript.

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Flipped Classroom Formats in a Problem-Based Learning Course: Experiences of First-Year Bachelor European Public Health Students

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Objectives: Students would like to see more creativity and flexibility in the performance of problem-based learning (PBL). Therefore, we applied flipped classroom formats in a course of the Bachelor European Public Health at Maastricht University to investigate the experiences of the students. The main objective was to stimulate interaction between students mutual, and between students and teachers.

Methods: 304 first-year students following the course on "Ageing in Europe" in three academic years, were asked to fill out questions focussing on prior knowledge, preparation work, and group session parameters, e.g., duration, content, extent of interaction and format group session.

Results: In-class activities, such as debate, making a mind map, giving a pitch, role-play e.g., were highly appreciated by students, especially the interactivity and discussions with the experts during these sessions. Students felt they applied knowledge.

Conclusion: Flipped classroom formats can be used to extend the Maastricht University PBL design and students do recommend this. It can be a relevant and challenging answer on the articulated request for more creativity and flexibility in the regular PBL format.

Keywords: problem-based learning, flipped classroom, education in ageing in Europe, bachelor European Public Health students, expert meetings in education

INTRODUCTION

All over the world, higher education institutes embrace problem-based learning (PBL) approaches [1]. The reason for this is that this educational method encourage students in their learning, "to get students to adopt a deep approach to studying" [2], p. 880. The four underlying key learning principles behind PBL are, that learning should be constructive-, self-regulated, collaborative and contextual [3]. These learning principles should enhance deep learning. A review of the literature in PBL, in which twenty-

one studies were included, seems to confirm this statement by concluding that PBL seems to enhance deep learning [4].

At Maastricht University, PBL has been at the heart of the university ever since the university was founded (i.e., 1974) and while still successful, there is a need to consider ongoing developments. New methods have been developed since and might be beneficial to strengthen the current PBL implementation. The PBL-approach is aimed at achieving two educational objectives: the acquisition of an integrated body of knowledge related to problems and the development or application of problem-solving skills [5]. As a student, you work in small groups, engage in hands-on training and attend (far) fewer lectures than in traditional education. Under the supervision of a tutor, you team up with ten to twelve students to tackle real-life challenges, in so-called tutorials. In classic face-to-face tutorials at Maastricht University the “seven-step approach” is used, spread over three distinct phases: pre-discussion, self-study, and reporting [6]. The seven-step approach is successful, but signs of erosion are seen in the recent years. For example, using the same approach each time changes stepwise in a tick-off routine instead of stimulating and challenging students. In tutorials, important steps are being skipped. Integrating and applying new acquired knowledge is therefore considered difficult [7]. In a position paper of Maastricht University, dissatisfaction with the PBL practice was reported. Students would like to see more creativity and flexibility in the performance of PBL. There is a need for education in small groups other than only seven-step tutorial groups [8, 9]. Students of today with various backgrounds grow up in an online world and are assertive. Creative and flexible formats, a variation on the format of a regular PBL tutorial group, are therefore required [10]. Flipped classroom approaches have the ability to meet with the current students’ background, wishes, and needs and therewith are a candidate to explore design variations on the format of a regular PBL tutorial group. A main opportunity of this approach is the development of students’ deep understanding of the material [11]. A flipped classroom approach meets the following characteristics: content delivery in advance, awareness of the educator of students’ understanding, and higher-order learning during face-to-face sessions [12]. Student-centred learning activities are integrated in the classroom instead of teacher-centred instruction [13]. In a scoping review on the use of flipped classroom, results showed “much indirect evidence emerging of improved academic performance and student and staff satisfaction with the flipped approach” (12, p. 85). Also Låg and Sæle (2019) are preserved with their findings [13]. In their systematic review and meta-analysis, a small positive impact on student learning in flipped classroom formats was found. Findings stated that there is no single model for flipped classroom [12, 14]. Two elements should be implemented for a successful model, in- and outside the classroom, student learning that facilitates critical thinking, and student engagement [12]. While studies and reviews of PBL [4, 15] and flipped classrooms [11–13] are widely available, studies on the combination of flipped classroom and PBL in higher education are scarce [16].

Adding flipped classroom characteristics in an existing PBL course is with the expectation that it will further stimulate interaction, understanding and engagement of the students so

that students are more eager to learn, share experiences with each other and gain knowledge. In this study, we focus on the students’ experiences of flipped classroom formats. To investigate this we adapted and investigated an existing 4-weeks course focusing on ageing in Europe at Maastricht University in which the existing PBL design has been extended with flipped classroom characteristics during several academic years. The following research question was formulated: How do first-year Bachelor European Public Health students experience flipped classroom formats? The main goals of these formats were to stimulate interaction between students and between students and teachers, to stimulate a broad understanding of the content of the course, and to gain knowledge in a way that makes them better adapted to the needs of their future working field.

METHODS

Research Design

Underlying descriptive research was conducted in a real-life setting [15]. In this case-study, we wanted to explore design variations of PBL and flipped classroom to obtain a general impression on how students perceived these designs i.e., if they perceived that in these designs they could apply their knowledge, have their questions answered, and learnt.

Participants

Participants were the students of the regular cohorts of the academic years, 2015-2016, 2016-2017 and 2018-2019 of the first year bachelor European Public Health Program. They followed the course “Ageing in Europe”, the final PBL course of the 2nd semester.

Program and Course “Ageing in Europe”

The flipped classroom formats were applied in the bachelor program European Public Health at Maastricht University. This is a 3-years program (180 ECTS), including a multidisciplinary and international focus, that bridges the gap between public health science and (inter)national (especially European) public health developments and policies.

In semester 2, study year 1, fulltime students follow a 4-weeks course (5 ECTS), entitled “Ageing in Europe.” The course introduces students to the issue of an ageing European population and its consequences for health and social care. Different philosophical, ethical and policy approaches to the care of the older persons within European healthcare systems will be discussed, as well sociocultural issues. **Figure 1** gives an overview of the course including the methodology, epidemiology and statistics trajectory. In three themes, ageing in Europe (week 1), ageing and diversity (week 2), and long-term care (week 3), flipped classroom characteristics were implemented.

Educational Format: From Regular PBL Towards Flipped Classroom Formats

In **Table 1**, an overview of the educational format of the three study themes (“ageing in Europe,” “ageing and diversity” and

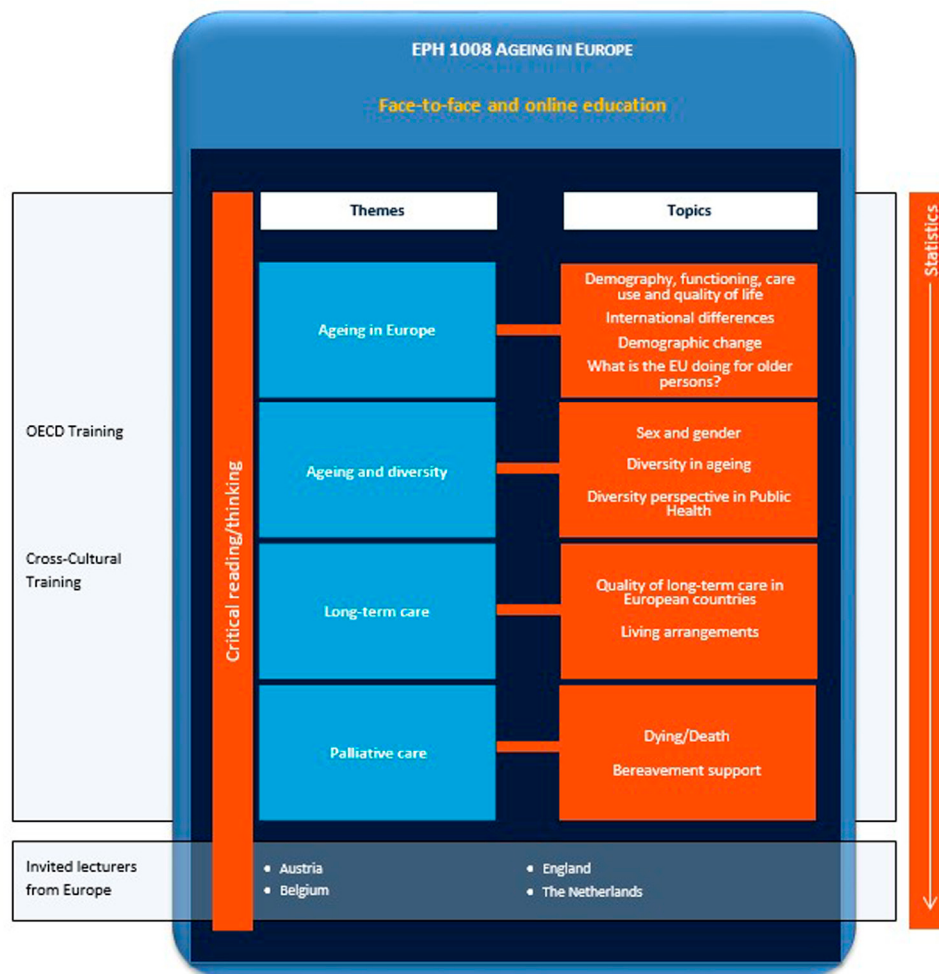


FIGURE 1 | Overview of the Course “Ageing in Europe” (Maastricht 2021). Week 1 focuses on changes in the demographic profile of Europe, different views on the severity of the problem, and the solutions posited to it from an international perspective. In week 2 diversity and its relationship with inequality with respect to health and social care is the central issue of interest. Week 3 focuses on the delivery of long-term care for older people in Europe, ranging from professional home care to institutionalized care in nursing homes, and all its variations. In week 4 palliative care is addressed, including dying/death and bereavement support.

“long-term care”) is presented for four academic years (2014-2015 (Y1), 2015-2016 (Y2), 2016-2017 (Y3) and 2018-2019 (Y4)). In academic year 2014-2015, the regular PBL is presented. From that academic year onwards, changes towards flipped classroom were gradually implemented. In **Table 2**, reasons for these changes are listed. In the paragraph below, you will read how the themes were offered in a flipped classroom format to students in the different academic years (Y2, Y3, and Y4).

Theme “Ageing in Europe” (Week 1)

In all academic years the theme “Ageing in Europe” was introduced by a lecture on the first day of the course. It also acted as an introductory lecture of the course. In Y1 and Y2, the case “Ageing in Europe: a debate about numbers, facts and impact” followed a regular PBL format. In brief, this means in the first session a tutorial group (10–12 students and 1 tutor)

discuss the case and set the learning goals to study. Next, in their self-study time students should study the given literature. In the second session, the students discuss and elaborate on the learning goals based on what they studied. In Y3 and Y4, the format changed. The pre-discussion in the tutorial group about the case was directed by two additional questions to stimulate discussion. However, now instead of agreeing on a set of learning goals for all to study and discuss in the second session, the students were asked to prepare for a plenary session with 3-4 tutorial groups together and present their findings to the questions and learning goals set. Afterwards, in a debate the group of students were divided into two random groups (agree group and disagree group) for discussing a statement (“In 2080 people become 130 years of age”). Before the debate, the two groups had given time for preparing themselves by exchanging their findings of literature.

TABLE 1 | Educational format of the three themes in the different academic years (White = regular Problem-Based Learning (PBL); Black = Flipped Classroom) (Maastricht 2021).

	Academic year 2014-2015	Academic year 2015-2016	Academic year 2016-2017/2018-2019
Themes in the course (week)			
Ageing in Europe (numbers) (week 1)	In class: 1 face-to-face lecture (2 h) regular PBL task (pre-discussion) Self-study: Reading literature	In class: 1 face-to-face lecture (2 h) regular PBL task (pre-discussion) Self-study: Reading literature	In class 1 Face-to-face lecture (1.5 h) Pre-discussion ^{a,b} Self-study: Reading literature Preparation presentation (group ^b) Preparation discussion (individual) In class ^b Presentations Debate
Ageing and diversity (week 2)	In class: Regular PBL task (pre-discussion) Self-study: Reading literature	In class: Regular PBL task (post-discussion) Self-study: Reading literature 3 short (13–22 min) recorded lectures Follow an online module Answering questions	In class Pre-discussion ^{a,b} Self-study: Reading literature Make a summary of the literature 3 short (13–22 min) recorded lectures Answering questions Small-scaled research
Long-term care (week 3)	In class: Regular PBL task (post-discussion) 1 Face-to-face interactive lecture (2 h) In class: Regular PBL task (pre-discussion) Self-study: Reading literature 3 short (12–20 min) video clips 4 YouTube videos In class: Regular PBL task (post-discussion)	In class: Answering questions in small groups Discussion of different topics In class: Regular PBL task (pre-discussion) Self-study: Reading literature 3 short (12–20 min) recorded lectures 4 YouTube videos In class: Post-discussion in group session Role play	In class: Developing a mind map Discussion of different topics In class: Regular PBL task (pre-discussion) Self-study: Reading literature 3 short (12–20 min) recorded lectures 4 YouTube videos In class: Post-discussion in group session/ pitch ^c Role play

^aStudents in a tutorial groups (maximum of 12 student in each group) discuss the topics themselves; a content expert for questions is available in the same room.

^bGroup consists of different tutorial groups.

^cThe pitch was only implemented in academic year 2018-2019.

TABLE 2 | Reasons for changes in the educational format of an academic year compare to the previous academic year (Maastricht 2021).

	Changes in 2015–2016 compared to 2014–2015 ^a	Changes in 2016–2017 compared to 2015–2016 ^b
Themes in the course (week)		
Ageing in Europe (numbers) (week 1)	—	Lecture is 30 min hour shorter, 1.5 h now: Reason: Attention of students decreased Remaining format is new: Format of the other 2 themes was successful
Ageing and diversity (week 2)	Entire format is new: Faculty member was disappointed in exam results Literature was not read and discussed properly The format was executed by a new faculty member	—
Long-term care (week 3)	Introduction of the group session afterwards: Prepare students for future job Apply knowledge	—

^aIn academic year 2014–2015 and 2015–2016 each tutorial group had its own tutor. In academic year 2016–2017 involvement of a tutor disappeared. Experts served groups.

^bNo considerable changes were performed in academic year 2018–2019.

Theme “Ageing and Diversity” (Week 2)

In Y1, a regular PBL task was offered to students. After the entire case, so after the second PBL session, an interactive lecture was given about this theme so that the lecturer made a recap to the theme and corresponding PBL task and students had the possibility to ask questions. In the following three academic years (Y2, Y3, and Y4) this format was changed. In Y2, three video clips were recorded on different topics, “Sex and gender,” “Diversity in ageing” and “Introducing a diversity perspective in Public Health.” Instead of starting with a PBL-session to discuss the case, students started with self-study and had to read the literature and, in addition, watch the videos, follow an online course and answer questions. Also, the post-discussion session was organised differently. The students did meet in a group of around 25 students. The students had to discuss the answers to the questions in small sub-groups (3–5 students) before discussing them plenary. In Y3 and Y4 the format was further adapted. The theme started with a PBL-group session (pre-discussion). Students were also asked if they had questions about the organisation of this theme. For the self-study, the video clips of Y2 were used. Literature was asked for reading as well, but making a summary of it was extra. Like the Y2-cohort, students of Y3 and Y4 had to answer questions. In addition, they had to execute a small-scale research individually. In the group session, including 3–4 tutorial groups, the diversity expert asked the students to organise in groups of four and make a mind map. The expert elaborated on the topic with each group separately. The content was also discussed plenary.

Theme “Long-Term Care” (Week 3)

In Y1, a regular PBL task on housing with care was offered. The self-study, however, was extended with three video clips, specifically recorded for this theme and four video clips selected from YouTube. The video clips provided explanation of the theoretical underpinnings of the impact of long-term care environments on older people as well as practice-based examples from nursing homes. In Y2, Y3, and Y4 the same PBL task was used, but the post-discussion was different. The post-discussion of the tutorial group meeting was replaced by a group session in which the learning goals were shortly discussed and the students had to prepare and perform a role-play to experience aspects of the theme. The students discussed with the experts a real-life case of Mrs. X and which housing with care option would be best in her case: living at home with support, moving into a regular nursing home or an innovative, small-scale homelike care environment. The students were grouped, each representing a specific stakeholder perspective: the older person and her daughter, the nurse and the management of the care organisation. Using the theory from the lectures and self-study the students discussed the best care option. To stimulate discussion, in Y4 student groups also prepared a 1-min pitch about an innovative nursing home within a country of their choice describing the concept and its underlying care principles. In this academic year, students were also able to visit a nursing home physically.

Procedure and Data Collection

Participation in course evaluation activities was anonymously/ anonymized and voluntary. Data were collected during or immediately after the course.

Student Perspective: Questionnaire

In Y1, no data were collected, because there was no flipped-classroom format. A questionnaire (**Supplementary Appendix S1**), designed by the researchers themselves, focusing on student perspectives regarding the educational format was obtained directly after the group session in Y2 (weeks 2 and 3) and Y3/ Y4 (weeks 1, 2 and 3). An online survey tool, Qualtrics, was used in Y2 and Y3. In Y4, a pen and paper questionnaire was used because of results in response rates in Y2 and Y3. Fourteen closed questions focused on prior knowledge, preparation work, and group session parameters (e.g., duration, content, extent of interaction and format group session). Answers were rated on a scale from 1 (very bad) to 10 (very good), on a dichotomy scale or on 4-points Likert scale (very dissatisfied to very satisfied; fully disagree to fully agree). Students were asked to elaborate their answer in three open-end questions.

Data Analysis

The quantitative data in the different academic years were subjected to simple descriptive analyses (frequencies, means and standard deviations). Open questions were analysed by summarizing the answers. Citations were used to enforce the findings on the closed questions.

RESULTS

Participants and Response

In total 304 first-year bachelor European Public Health students followed the course “Ageing in Europe” spread over the three academic years: 2015-2016 (Y2), 2016-2017 (Y3) and 2018-2019 (Y4) with respectively, 116, 94 and 94 students. The response rate in Y2 and Y3 range runs between 15% and 64% for the questionnaires. No response rate of Y4 was calculated, because resit students could also join these sessions. In Y2 and Y3, there were no resit students in the sessions. In **Table 3** students’ attendance rate of the group sessions as well as the number of students who filled out the questionnaire in Y2, Y3, and Y4 are presented.

Students’ Experiences With Flipped-Classroom Characteristics

Experiences of Sessions in General

Students liked the in-class activities, such as debate, making mind map, giving a pitch, role-play. The interactivity and discussions with the experts during these sessions were assessed most positively. In all three academic years, students were satisfied about the duration, content, extent of interaction, and the format of all sessions.

On a range from 1 (very dissatisfied) to 4 (very satisfied) students scored an average between 3.0 and 3.4 (**Table 4**). Only in

TABLE 3 | Rates of students' attending the group sessions and filling out questionnaires in the different academic years (Maastricht 2021).

	Total (n)	Ageing in Europe (numbers) (week 1)		Ageing and diversity (week 2)		Long-term care (week 3)	
		Attending session	Fill out questionnaire	Attending session	Fill out questionnaire	Attending session	Fill out questionnaire
2015–2016	116	—	—	90 (78%)	62 (53%)	73 (63%)	17 (15%)
2016–2017	94	79 (84%)	60 (64%)	87 (93%)	38 (40%)	88 (94%)	30 (32%)
2018–2019 ^a	94	83 (?)	76 (?)	78 (?)	81 (?)	78 (?)	73 (?)

^aStudents of other academic years could join when failing the exam.

TABLE 4 | Results on how students rate the session in the different academic years (Maastricht 2021).

	N	Duration of session	Content of session	Extent of interaction	Format of session	Overall grades ^b			
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Min	Max	Mean (SD)	n
2015–2016									
Week 2 (diversity)	55	3.2 (0.60) ^a	3.2 (0.41)	3.4 (0.58)	3.2 (0.57)	3	10	7.6 (1.58)	55
Week 3 (housing)	12	3.2 (0.55)	3.0 (0.58)	3.0 (0.71)	3.0 (0.58)	5	10	7.5 (1.50)	12
2016–2017									
Week 1 (numbers)	45	3.0 (0.56)	2.8 ^c (0.63)	3.1 (0.66) ^e	2.7 ^c (0.69)	3	10	6.5 ^d (1.56)	45
Week 2 (diversity)	24	3.3 (0.45)	3.3 (0.52)	3.4 (0.57)	3.3 (0.61)	5	10	7.7 (1.31)	24
Week 3 (housing)	28	3.1 (0.87)	3.0 (0.76)	3.2 (0.67)	3.0 (0.73)	3	10	7.6 (1.45)	28
2018–2019									
Week 1 (numbers)	75	2.9 (0.56) ^{c, f}	3.2 (0.53)	3.1 (0.56)	2.9 (0.69)	4	10	7.5 (1.16)	75
Week 2 (diversity)	78	3.1 (0.52)	3.2 (0.55) ^g	3.2 (0.68) ^g	3.2 (0.60)	3	10	7.7 (1.45)	80
Week 3 (housing)	72	3.2 (0.54)	3.2 (0.54)	3.3 (0.60)	3.2 (0.60) ^h	5	10	7.8 (1.06)	72

^aRange 1 (very dissatisfied)–4 (very satisfied).

^bRange 1 (very poor)–10 (excellent).

^cA score below 3.0 is a point of interest.

^dA score below 7.0 is a point of interest.

^en = 44.

^fn = 76.

^gn = 80.

^hn = 73.

week 1, “Ageing in Europe,” four average score (in Y3 and Y4) were lower than 3.0. The overall grade (10-point scale) of this session was rated with a 6.5 in Y3, in Y4 this score was 7.5 (Table 4). The other two theme sessions in Y2, Y3 and Y4 scored 7.5 or higher.

In Table 5, answers on three statements for the different themes are presented: “I had the feeling I could apply knowledge,” “My questions were answered” and “I have learned a lot.” For each statement, the range was 1 (very dissatisfied) up to and including 4 (very satisfied). Overall, students were satisfied. Scores were mostly rated from 2.9 and higher. Each session of the themes was recommended by 75% or more of the students, except for the session with respect to the theme “Ageing in Europe” in Y3. This session was recommended by 56% of the students.

Theme “Ageing in Europe” (Week 1): Y3 and Y4

The majority of the students (Y3: $n = 41$, $p = 79\%$; Y4: $n = 68$, $p = 93\%$) reported the session fits in the course. It is not clear whether students had prior knowledge. Most students (Y3: $n = 48$, $p = 92\%$; Y4: $n = 75$, $p = 100\%$) prepared for the session. It is unclear how students prepared. Two students in Y3 gave an explanation for not preparing: “I didn’t feel well” and “I was busy with my student association.” More than half of the students (Y3: $n = 29$,

$p = 57\%$; Y4: $n = 52$, $p = 72\%$) liked the format of the session. Nine students (Y3: $n = 8$; Y4: $n = 1$) liked the debate; and eleven times “discussion” was counted in a positive way (Y3: $n = 6$; Y4: $n = 5$). Also, “we had professionals around to consult,” “applying knowledge,” “everyone participates,” “interactive and dynamic,” “it was well structured” and “challenging” were filled out in the questionnaire. Eight students (Y3: $n = 5$; Y4: $n = 3$) did not like the large size of the group. 27 other students (Y3: $n = 3$; Y4: $n = 24$) mentioned the students’ presentations were too similar. Four other students (Y3: $n = 2$; Y4: $n = 2$) preferred a “normal” post-discussion.

Theme “Ageing and Diversity” (Week 2): Y2, Y3, and Y4

In Y2 ($n = 57$, $p = 92\%$), Y3 ($n = 35$, $p = 95\%$) and Y4 ($n = 74$, $p = 97\%$), over 90% of the students reported the session fits in the course. More than 90% of the students did have enough prior knowledge for following the session (Y2: $n = 60$, $p = 97\%$; Y3: $n = 35$, $p = 95\%$; Y4: $n = 79$, $p = 99\%$). In Y2, one student ($p = 2\%$) did not prepare for the session. The student in Y2 gave as reason “was not able fully prepare due to the amount of workload that needed catching up on.” In Y3 and Y4, respectively eight ($p = 23\%$) and four students ($p = 5\%$) did not prepare. Two of them in Y3 gave a reason for it: “busy with assignments of module” and “busy with other things”. In Y4 one student filled out this section saying “the

TABLE 5 | Results of the group sessions in the different academic years (Maastricht 2021).

	N	I had the feeling	My questions were answered	I have learnt a lot
		I could apply knowledge		
		Mean (SD)	Mean (SD)	Mean (SD)
2015–2016				
Week 2 (diversity)	59	3.2 ^a (0.72)	3.3 (0.73) ^c	2.9 ^{b,d} (0.74)
Week 3 (housing)	13	3.0 (0.96)	3.1 (0.62)	2.9 ^b (0.62)
2016–2017				
Week 1 (numbers)	48	2.9 ^b (0.67)	3.0 (0.58)	2.7 ^b (0.66)
Week 2 (diversity)	28	3.3 (0.63)	3.3 (0.54) ^e	3.0 (0.69) ^e
Week 3 (housing)	29	3.2 (0.53)	3.1 (0.48)	2.9 ^b (0.64)
2018–2019				
Week 1 (numbers)	76	3.2 (0.49)	3.3 (0.49) ^f	3.1 (0.52) ^g
Week 2 (diversity)	80	3.3 (0.60)	3.3 (0.52) ^h	3.1 (0.66) ⁱ
Week 3 (housing)	73	3.2 (0.49)	3.3 (0.48) ^j	3.0 (0.70) ^k

^aRange 1 (very dissatisfied) – 4 (very satisfied).

^bA score below 3.0 is a point of interest.

^cn = 57.

^dn = 58.

^en = 27.

^fn = 75.

^gn = 73.

^hn = 78.

ⁱn = 76.

^jn = 70.

^kn = 69.

last exam was last week so I still feel a little exhausted and I wanted to take it slower this week.” How students prepare is not clear. The format of the session was liked, 150 students (Y2: $n = 50$, $p = 82\%$; Y3: $n = 28$, $p = 88\%$; Y4: $n = 72$, $p = 91\%$) of the 171 students in all academic years who answered the question were positive. ‘Interactive’ was explicitly mentioned as a positive aspect, also written in combination with group session and discussion such as “interaction, space for discussion in small group.” Next to this aspect, effective, original, size of group, productivity, structure, role of expert, possibility to ask questions and apply knowledge were also reported as positive. Eleven students ($p = 18\%$) in Y2 did not like the format. Eight students gave a reason. The most mentioned reason ($n = 5$) was related to wishes in having a “normal” tutorial group meeting. Four students ($p = 13\%$) in Y3 were dissatisfied with the format of the session. Three of them gave a reason: “too big groups, no tutor per group,” “didn’t get in depth with the literature,” and “the tutor were spread finely among the small sub groups.” Seven students ($p = 9\%$) did not like the format in Y4. Reasons were, preferring a lecture, not liking the format or content and knowledge of expert was missing.

Theme “Long-Term Care” (Week 3): Y2, Y3 and Y4

After the group session in Y2, the expert forgot to mention to fill out the questionnaire. In Y2, thirteen students ($p = 76\%$) agreed the course fits in the course. In Y3 and Y4, the majority (Y3: $n = 27$, $p = 90\%$; Y4: $n = 56$, $p = 92\%$) agreed on this. In all three academic years, most of the students, respectively 15 ($p = 88\%$), 27 ($p = 90\%$) and 67 ($p = 99\%$) students, had enough prior knowledge for following the group session. The two students in Y2 who did not have enough prior knowledge gave as reason they were not prepared. It is not clear how students prepare for the group session,

but most students did prepare: 13 students ($p = 77\%$) in Y2, 29 students ($p = 97\%$) in Y3 and 72 students ($p = 100\%$) in Y4. Two out of three students in Y2, who did not prepare.

In Y2, 80% of the students ($n = 12$) liked the format of the session, in Y3 and Y4 this was, respectively, 87% ($n = 26$) and 96% ($n = 68$). Thirteen positive remarks were related to application of knowledge. Examples are: “Real case simulation” and “it is close to what we are going to do in the future.” Interaction was positively mentioned twenty times. Moreover, structure, productivity group discussion, interest, and engagement were also reported as positive aspects of this format. In addition, in Y4, twelve students were speaking highly of the pitches. Eleven students of the total group ($n = 45$) (Y2: $n = 3$, $p = 20\%$; Y3: $n = 4$, $p = 13\%$; Y4: $n = 3$, $p = 4\%$) disliked the format. “Role-play was not beneficial” and “too large group” were mentioned as negative points.

DISCUSSION

The findings in this study expressed students’ perceptions of flipped-classroom formats. In-class activities, such as debate, making mind map, giving a pitch, role-play e.g., were highly appreciated by students, especially the interactivity and discussions with the experts during these sessions. Students were satisfied about the duration, content, extent of interaction, and flipped classroom formats of all sessions in the three academic years. The study found students put effort and time in preparation (prior to class) and in group sessions (in-class). Results indicated that group sessions were highly appreciated by students, especially the interactivity of the

sessions and discussions with the experts during these sessions. Students felt they applied knowledge at the end of the course. In a study of Alebrahim and Ku (2020), the majority of the fourteen undergraduate students also liked the flipped classroom format [16]. Students had to access academic media before discussing and applying the content with the professor in class. Similar to our study, their engagement was increased [16]. Following our students, the various flipped classroom formats including different preparation work and in-class activities like, debate, presentations, and role-plays e.g., did fit in the course. It is not clear which format students preferred the most. Using different flipped classroom formats can address various learning styles throughout the course, which can help students in their learning (addresses different cognitive levels) [17]. The group activities can also provide additional benefits, such as developing leadership skills, which are important for their future job [18–20]. Some of our students did mention that they realized the flipped classroom (the in-class part) was close to what they will do in their future jobs. The few students who were not fond of the group sessions tend to share the same underlying reasons, i.e., a too large size of the group, presentations of peers were too similar and not going into depth in literature. In order to keep the group sessions dynamic and interactive, it can be a recommendation for the future to make sure that presentations will have as little as possible repetition in content. This way, problems can be discussed from a broader perspective and eventually with even more depth. The group size of each in-class activity should be tailored made, which means group sizes can differ for various in-class activities. More than 90% of the students reported to have enough prior knowledge for following the session. Perhaps, profitability of the group sessions can increase with the implementation of themes of perspectives on problems, of which can be assumed that prior knowledge will be limited and peers will be more dependent of each other in order to gain this extra knowledge. As mentioned before, more focus overcomes the repetition in presentations and stimulates going into depth.

Limitations and Future Research

Overall participation in the questionnaires (academic years 2015–2016 and 2016–2017) was fair however with a wide spread and a clear tendency to decrease each week. This can be related to students were getting tired of being asked to fill out one every week. In academic year 2015–2016, the decrease was unexpectedly large. This was caused by an omission of the expert who did forget to hand out the questionnaires after one session. In academic year 2018–2019, pen and pencil questionnaires were used to stimulate students to fill out the questionnaires. Ongoing research should also consider this. Interesting will be the fact whether the flipped classroom formats will have an effect on the motivation of students, students' self-directed learning skills (e.g., planning, monitoring), students' preparation for their future jobs and students' success rates on exams. In spite of a positive finding in students' experiences, the question is whether the regular exam still fits to the teaching and learning activities. Are the intended learning outcomes, teaching and learning activities and the

assessment method still constructively aligned? Further research should explore this.

Conclusion

Flipped classroom formats can be used to extend the Maastricht University PBL design and students do recommend this. It can be a relevant and challenging answer on the articulated request for more varied tutorial group approaches i.e., other than the regular seven-step tutorial group and on the increasing diverse public of students, with different backgrounds, studying in an environment that is no longer only based on books and written theories.

AUTHOR CONTRIBUTIONS

NdJ is an expert in the development of blended learning health educational programmes. IP is an expert in the fields regarding quality evaluation of educational (medical, postgraduate medical and nursing) programmes. NdJ and IP performed the study. PvR is an expert in the field of instructional design and e-learning with experience in serious games, MOOCs, and computer supported cooperative learning etc. PvR advised both principle researchers (NdJ and IP) about the performance of the study and corrected the text of the paper. MTB, MHB, and HV developed and performed in collaboration with NdJ the flipped classroom formats for the different academic years. One of MTBs current research interests are diversity and inclusion in healthcare, in particular the access of LGBT people to reproductive care. The research of MHB focuses on the effectiveness of health care (e.g., involuntary treatment reduction and prevention) and on the organization of the care process (e.g., best practices in dementia care and innovations in health care). HV is professor of Long-Term Care Environments and Vice-chair of the Living Lab in Ageing and Long-Term Care. Her expertise is research in innovative long-term care from a transdisciplinary perspective. MTB, MHB, and HV contributed in correcting the article.

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CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.ssph-journal.org/articles/10.3389/phrs.2022.1604795/full#supplementary-material>

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Removing the Graduate Record Examination as an Admissions Requirement Does Not Impact Student Success

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Background: The predictive validity of components of the Graduate Record Examination (GRE) on student success is inconsistent, and the test itself has been shown to be a barrier for prospective students historically underrepresented in graduate programs.

Policy Options and Recommendations: We analyzed three admissions cycles for the Master of Public Health degree at the Boston University School of Public Health before (2016, 2017, 2018) and after (2019, 2020, 2021) eliminating the GRE for diversity and quality of applications, student success, and employment outcomes. We observed increases in diversity (e.g., 7.1% and 7.0% self-identified as African American/Black and Hispanic before eliminating the GRE as compared to 8.5% and 8.2% after), but no loss of quality, as measured by undergraduate grade point averages (GPAs) (e.g., median undergraduate GPA before and after eliminating the GRE of 3.4). We also saw no difference in performance in required core courses (e.g., more than 93.5% of students earned passing grades in required courses before and 94.5% after eliminating the GRE) and graduate employment (i.e., 93.1% employed within 6 months of graduation before and 93.8% after eliminating the GRE). We recommend removing the GRE as an admission requirement for the MPH as a step toward diversifying the public health workforce. This change alone is necessary but insufficient. We also need to develop support programs, tailored specifically to the needs of our future students, to ensure their success.

Conclusion: Eliminating the GRE as an admissions requirement for prospective students does not result in loss of student quality or worse program performance.

Keywords: workforce development, diversity, GRE, admissions requirements, MPH

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Removing the Graduate Record
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BACKGROUND

The Graduate Record Examination (GRE) General Test assesses verbal, quantitative, critical thinking, and writing skills and has been required in applications for most graduate programs in the United States, including master's and doctoral programs in public health. Over the past decade, numerous programs changed their admissions requirements, with some dropping the GRE entirely, and others making it optional [1]. There were two principal motivations for this change: preliminary evidence that the GRE may not correlate with success in graduate programs, and that the GRE was a barrier to admission for students who have been historically underrepresented in graduate programs. The COVID-19 pandemic added an additional motivation to drop GRE as an admissions

requirement as many prospective students could not access testing centers, hindering their ability to complete their applications.

Boston University School of Public Health (BUSPH) aims to recruit, retain and support the success of a diverse student body in all of our programs, seeing diversity and inclusion as essential to fulfilling our mission as an academic public health institution; a mission firmly rooted in social justice. We therefore aim to remove any barriers that interfere with recruitment, retention and success of diverse students. One such barrier was the GRE, which prior to 2019, was a required component for admission to all of our graduate degree programs (i.e., Master of Public Health (MPH), Master of Science (MS), PhD and DrPH). Beginning in fall of 2019, we eliminated the GRE requirement for admission based on three concerns.

First, the GRE is financially burdensome. The cost of the general examination is over \$200, there are additional fees to send scores to specific programs [2], and GRE tutoring and preparatory courses can cost in excess of thousands of dollars.

Second, the GRE has been shown to disadvantage women and minority students, particularly in science, technology, engineering and mathematics (STEM) fields [3]. Standardized tests in general, including the GRE, have been shown to be systematically biased with test scores associated with socioeconomic status, race and gender [4]. The Educational Testing Service (ETS), the organization that administers the exam, reports that women score on average 80 points lower than men, African Americans some 200 points lower than whites [5].

Third, the correlation between GRE scores and academic success in graduate school is weak [6]. A meta-analysis of over 1700 studies reported weak, even negative, correlations between GRE scores and measures of success in graduate programs such as degree attainment, time to completion, and research publications and presentations [7]. Internal analysis of data from BU MPH students showed no significant differences in mean GRE component scores between first year students who failed to achieve an overall 3.0 GPA and those who did not (data not shown).

Therefore, in 2019 we eliminated the GRE for a pilot period of 3 years. During that time, we evaluated application trends with respect to diversity and quality, tracked student success in terms of academic performance in required core courses and in graduate outcomes as reflected in employment statistics. Here we present data on student diversity and success in our MPH program before and after eliminating the GRE requirement.

EVIDENCE

This analysis considers data on all MPH program applications for fall admission cycles from 2016 through 2021. This represents three cycles before we eliminated the GRE (2016, 2017, 2018) and three after (2019, 2020, 2021).

Data were merged from three sources, the Schools of Public Health Application Service (SOPHAS), the university information system, and alumni surveys. Demographic data, including sex, date of birth, race, ethnicity, and US citizenship

were self-reported on SOPHAS applications. We added two additional, custom questions to our application to assess if applicants were first in their families to complete an undergraduate or a graduate degree. Applicants also enter all courses completed, credits and grades earned. SOPHAS verifies these data and calculates standardized, semester-based, grade point averages (GPAs) by assigning numeric grades to letter grades, summing these and weighting by course credits. Each course is then categorized into a subject area (e.g., biology/chemistry/physics/life science, business, health science, math/statistics, other, public health, social/behavioral) and subject-specific GPAs are computed using the same approach [8]. Grades in required courses for the MPH were extracted from our university information system and merged with SOPHAS data by unique student identification numbers assigned at application. Employment status within 6 months of graduation is gathered by alumni surveys which are sent *via* e-mail and LinkedIn.

For each cycle, we summarized demographic characteristics of applicants (see **Table 1**). We tested for significant differences in categorical and quantitative demographic characteristics before and after eliminating the GRE using chi-square tests and analysis of variance, respectively. Following the elimination of the GRE, we observed a significant difference ($p < 0.001$) in the numbers of applicants who self-identified as African American/Black (8.5% versus 7.1%), Asian (15.1% versus 15.0%), and Hispanic (8.2% versus 7.0%), and significantly higher percentages of first-generation graduate school applicants (38.8% versus 36.5%, $p = 0.012$). We also received applications from students who completed undergraduate degrees at institutions not previously represented (data not shown). Quality of applications, based on undergraduate GPA overall and GPA in math/statistics, was not different before (median 3.4 overall and 3.2 in math/statistics) and after (median 3.4 overall and 3.2 in math/statistics) eliminating the GRE ($p = 0.375$ and $p = 0.510$, respectively).

To assess student success, we evaluated student performance in four integrated core courses, required of all MPH students, regardless of their choice of specialization. Students must earn a minimum grade of B- in each core course in order to progress in the program. Students who do not earn the minimum grade must retake the course. The required courses are: Quantitative methods for public health; Leadership and management in public health; Health systems, law, and policy; and Individual, community and population health. In **Table 2** we summarize student performance in each core course, specifically, the percentages of students who passed each course, failed to earn the minimum required grade of B-, and who withdrew for each application cycle (see **Table 2**). Withdrawals occur for a number of reasons. In some instances, students experience an unforeseen life event and need to withdraw, in others, students are struggling and advised to withdraw if they are at risk for failing the course and might need time to focus on other courses. Unfortunately, data are not available to distinguish these different scenarios. We tested for significant differences in student performance before and after eliminating the GRE using Fisher's exact test.

Student success remained strong after eliminating the GRE as an admissions requirement, as evidenced by performance in

TABLE 1 | Characteristics of applicants by admission cycle (Boston, Massachusetts. 2022).

Application cycle	GRE required for admission				GRE not required for admission				p
	2016	2017	2018	2016–2018	2019	2020	2021	2019–2021	
Applications to BUSPH MPH	1583	2074	1934	5591	1490	2023	2506	6019	
Female, %	79.6%	80.2%	80.7%	80.2%	78.7%	82.5%	82.3%	81.5%	<0.001
Age, years									
Mean (min–max)	24.4 (19–51)	24.5 (20–65)	24.4 (19–69)	24.4 (19–69)	24.4 (19–69)	24.5 (19–54)	24.3 (19–56)	24.4 (19–69)	0.488
Race/Ethnicity									
African American/Black	7.5%	6.9%	7.0%	7.1%	7.6%	8.9%	8.6%	8.5%	<0.001
Asian	14.7%	14.7%	15.5%	15.0%	16.1%	14.1%	15.3%	15.1%	
Hispanic	6.7%	7.1%	7.3%	7.0%	8.2%	6.8%	9.2%	8.2%	
White	40.9%	39.7%	39.8%	40.1%	38.7%	36.8%	39.2%	38.3%	
Two or more races	2.2%	3.2%	2.7%	2.7%	3.0%	3.3%	2.9%	3.0%	
Non-resident Alien	21.5%	22.4%	22.6%	22.2%	24.3%	27.4%	22.5%	24.5%	
US citizenship, %	75.3%	75.6%	75.2%	75.4%	72.6%	71.2%	75.6%	73.4%	<0.001
1st Gen Undergraduate, %	13.5%	14.7%	16.2%	14.9%	14.4%	15.5%	15.6%	15.3%	0.593
1st Generation Graduate, %	35.5%	36.9%	37.0%	36.5%	38.0%	40.0%	38.5%	38.8%	0.012
Undergraduate GPA									
Median (Q1–Q3)	3.5 (3.2–3.8)	3.5 (3.2–3.7)	3.5 (3.2–3.8)	3.4 (3.2–3.8)	3.5 (3.1–3.8)	3.5 (3.2–3.8)	3.5 (3.2–3.8)	3.4 (3.2–3.8)	0.375
Undergraduate Math GPA									
Median (Q1–Q3)	3.2 (2.7–3.7)	3.2 (2.7–3.7)	3.2 (2.7–3.7)	3.2 (2.8–3.7)	3.2 (2.6–3.7)	3.3 (2.6–3.7)	3.3 (2.7–3.8)	3.2 (2.8–3.8)	0.510

TABLE 2 | Student success in integrated core courses (Boston, Massachusetts. 2022).

Application cycle	GRE required for admission				GRE not required for admission				p
	2016	2017	2018	2016–2018	2019	2020	2021	2019–2021	
New enrollments	278	398	317	993	202	371	415	998	
Quantitative methods for public health									
% Passing	93.9%	97.7%	94.2%	95.6%	95.5%	93.2%	94.8%	94.5%	0.032
% Withdrawing	1.8%	0%	1.6%	1.0%	1.5%	1.6%	4.2%	2.5%	
% Failing to earn minimum grade of B-	4.3%	2.3%	4.1%	3.4%	3.0%	5.1%	1.0%	2.9%	
Leadership and management for public health									
% Passing	98.9%	99.0%	100.0%	99.3%	99.0%	99.2%	99.7%	99.4%	0.331
% Withdrawing	1.1%	0.3%	0%	0.4%	0%	0%	0.3%	0.1%	
% Failing to earn minimum grade of B-	0%	0.8%	0%	0.3%	1.0%	0.8%	0%	0.5%	
Health systems, law, and policy									
% Passing	86.0%	94.9%	98.4%	93.5%	96.5%	98.6%	98.3%	98.2%	<0.001
% Withdrawing	2.5%	1.3%	0.3%	1.3%	0.5%	0.3%	1.1%	0.6%	
% Failing to earn minimum grade of B-	11.5%	3.8%	1.3%	5.2%	3.0%	1.1%	0.6%	1.2%	
Individual, community, and population health									
% Passing	99.3%	99.2%	99.7%	99.4%	99.5%	98.9%	99.2%	99.2%	0.610
% Withdrawing	0.7%	0.3%	0.3%	0.4%	0.5%	0.3%	0.3%	0.3%	
% Failing to earn minimum grade of B-	0%	0.5%	0%	0.2%	0%	0.8%	0.5%	0.5%	

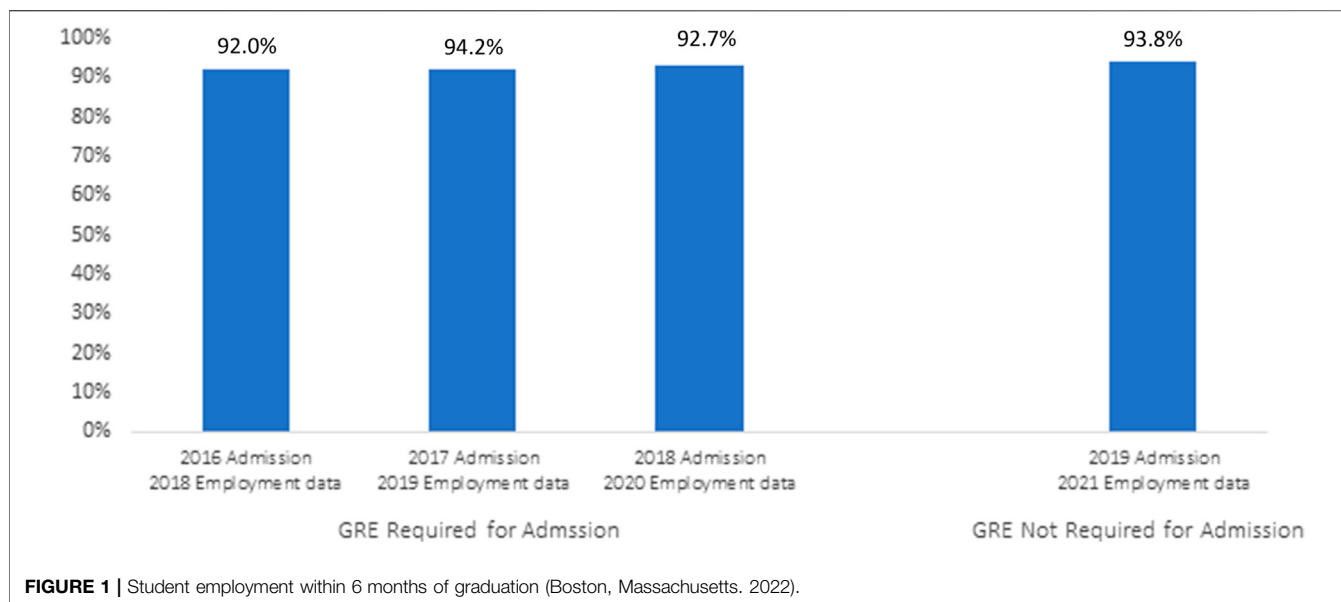
required core courses for the MPH. Percentages of students passing core courses ranged from 95.6% to 99.4% before eliminating the GRE and from 94.5% to 99.5% after eliminating the GRE. We did observe statistically significant differences in performance in two of four core courses, with fewer students failing after eliminating the GRE.

As a graduate professional program, BUSPH aims to prepare students for the public health workforce. We annually gather and analyze employment data by tracking student employment within 6 months of graduation. Our modal student completes the MPH program in 2 years. Thus, for each application cycle, we linked the employment data 2 years later. For example, for the 2016 admission cycle, we present the 2018 employment data. In **Figure 1**, we summarize employment data before and after the elimination of the GRE. For the 3 years prior to eliminating the GRE, we observed

92.0%, 94.2% and 92.7% of students employed within 6 months of graduation. For the first cohort where the GRE was not required (2019), we observed 93.8% employed within 6 months of graduation. There was no statistically significant difference in employment before versus after eliminating the GRE ($p = 0.831$). We are continuing to monitor graduate employment data for the 2020 and 2021 admissions cohorts and will report those data when they are available.

POLICY OPTIONS AND RECOMMENDATIONS

The Association of Schools and Programs of Public Health (ASPPH) reported that in 2021, 59% of schools and programs



did not require the GRE in MPH applications, up from 16% the year prior [9]. While we initially wanted to explore the impact of a temporary waiver of the GRE, we suggest that the evidence presented here should suggest the elimination of the GRE permanently as a condition for graduate school admission. The GRE is a potential barrier to the recruitment of a more diverse student body and our data suggest that we can identify applicants who will be successful academically and professionally without the GRE.

There are a number of contextual factors that may have affected our findings. First, the impact of the COVID-19 pandemic on all aspects of life, personal and professional, cannot be understated. Students all over the country reported substantial burden of stress during the pandemic, as courses shifted from being offered in-person, to fully remotely, and then in hybrid modality with some attending in-person and some remotely. Second, the school has increased its scholarship aid over time to meet students' growing financial needs. Even with the increase, some of our programs remain out of reach for many, suggesting that we may not be evaluating the utility of the GRE for a full spectrum of students who may otherwise apply to a school if cost was not a consideration. Third, as an institution, we have several key programs in place that are important to note. These include, but are not limited to, our core course tutoring program, peer coach writing program, and our new mentoring program for first generation students. All programs are free to students and managed through the BUSPH Office of Graduate Student Life. The core course tutoring program is a peer tutoring program for any MPH student at risk of failing to meet the required minimum grade in a core course. Interested students are matched with a peer tutor who works with them one-on-one, to provide assistance with course content and assessments. Tutors are trained and supported by the school. The peer coach writing program offers student-directed writing appointments to students enrolled in any SPH course, including the core courses. Students can work with a peer writing coach to brainstorm ideas or angles to approach specific topics,

receive feedback on outlines and drafts, and to navigate assignment rubrics. Peer writing coaches are trained and supported by the school. In fall of 2021, the school launched a mentoring program for first generation students to help them navigate the often complex system of higher education. Students self-identify for the program and are matched with faculty and staff mentors who themselves experienced graduate school as a first generation student. Faculty and staff are provided training and the school offers resources to mentors to support their meeting and working with mentees. It is possible that programs without these supports may find that some students, who might have previously not been admitted due to poor GRE scores, may struggle to succeed in graduate school.

CONCLUSION

BUSPH eliminated the GRE as an admissions requirement in 2019, motivated primarily by our aspirations to ensure equitable admission opportunity for all. We examined three admissions cycles before and three admissions cycles after eliminating the GRE for diversity and quality of applications, student academic success in required core courses, and employment within 6 months of graduation. Diversity of applicants increased slightly, quality remained high, students performed well in required core courses, and graduate employment data remained strong. Thus, we will not require the GRE for future admissions cycles. There is more work to do to ensure that we recruit, retain, and support a diverse student body. For example, we will continue to enhance programs to better support students historically underrepresented in graduate programs and first generation students, financially, academically, personally and professionally. The future of the public health workforce will be directly affected by the decisions academic institutions make to maintain or reduce barriers to access advanced public health degree programs and we support the removal of the GRE as an admission requirement as a way to eliminate one such barrier.

AUTHOR CONTRIBUTIONS

LS drafted the manuscript. AV, NL, AL, and SG reviewed and revised the manuscript. All authors approved the final version of the manuscript.

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CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Revolutionizing the Public Health Workforce—A Policy Brief in Retrospect of the World Congress on Public Health Rome 2020

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Background: The COVID-19 pandemic dramatically illustrates the consequences of inadequate prioritization of the Public Health Workforce (PHW). This Policy Brief introduces a *Call for Action* following the plenary session entitled "Revolutionising the Public Health Workforce (PHW) as Agents of Change" as part of the 2020 World Congress on Public Health.

Policy Options and Recommendations: In order to revolutionize the PHW, five long-term key approaches are proposed: 1. Transforming public health competencies through transdisciplinary education and inter-professional training; 2. Revolutionizing educational systems by shifting the public health paradigm; 3. Linking public health education and work opportunities; 4. Overcoming the paradoxical shortage and overproduction of graduates and 5. Developing adaptable, multisectoral agents of change.

Conclusion: Public health education of the future requires a paradigm shift towards a holistic understanding of public health, characterized by transdisciplinary education, inter-professional training and a closer integration of academia, health services, and communities.

Keywords: competencies, public health workforce, transdisciplinary education, interprofessional training, transformative learning

BACKGROUND

The importance of investment in the public health workforce PHW was emphasized in the 1988 Institute of Medicine (IOM) report, *The Future of Public Health* (1, 2). The importance of a positive policy climate for the development of PHW was also reiterated in the World Health Organization (WHO) Euro reports *Essential Public Health Operations* (3) and *Public Health Policy Framework Health 2020*, which focused on strengthening people-centered health systems and public health capacity (4). Although the professionalization of the PHW has become a flagship theme of

civil society organizations, the increased attention brought about by WHO Euro (5) has not led to sufficient prioritization of the PHW development by policy makers globally. It is a bitter yet important lesson that “savings” on the PHW in good times (6) have dramatic negative consequences when disasters inevitably strike.

The COVID-19 pandemic exemplifies this and highlights the need to include various disciplines and skillsets also from the outside of the biomedical paradigm, to tackle current and future public health emergencies such as global warming, armed conflicts, sustainability of health systems, migration, antimicrobial resistance, and many other interconnected problems. To address them effectively, the PHW requires a blend of evidence-based scientific competencies supported by systematic and political thinking, understanding of interconnectedness with ethics, and empathy for diversity (7). More than ever, the pandemic has shown that health and public health ethics, advocacy, networking, partnerships, and leadership must be engaged to build a healthier future for all (8). Paradoxically, to this day, the term “public health workforce” is not consistently defined due to its complexity as well as its cultural-historical footprint. The PHW includes people from a wide range of cultural and occupational backgrounds, employment settings, and sectors (9). Although the 2003 IOM committee on education defined a public health professional as “a person educated in public health or a related discipline employed to improve health through a population focus,” achieving consensus definitions of the PHW is difficult. More recently, delineations were made between different areas of the PHW defined as those individuals engaged in public health activities, contributing to the core functions of public health systems as the primary part of their role. They represent the *core PHW*. The wider *PHW* describes that part of the PHW that is only partially engaged in public health activities, including other professions. Thus, they indirectly contribute to public health efforts and impact on population health (10).

“While the *core PHW* has often been defined as existing within government agencies, it has also been acknowledged that public health work occurs in academia and within the voluntary/nongovernmental organizational sector (i.e., charities, non-profit organizations), healthcare, and corporations (for-profit companies) (9).”

Therefore, we need to look at the PHW workforce holistically through the lens of interdisciplinarity, inter-professionalism, and intersectorality. This requires a paradigm shift. We have reached a tipping point and there is great potential for transformation in the way the PHW is recognized globally.

We must urge policy makers, educationalists, and public health professionals to leave old paradigms. In fact, they should advocate a shift from a traditional, biomedical understanding to an inclusive approach embracing diverse systems and historical traditions. This would create a more holistic PHW, incorporating the concepts of one health,

planetary health, and emergency public health. However, the question remains: how can this be achieved?

WORLD CONGRESS ON PUBLIC HEALTH 2020

The theme of the 2020 World Congress on Public Health was “Public health for the future of humanity: analysis, advocacy and action.” The online Congress provided a forum for professional and scientific public health communities to focus on a public health paradigm that is emerging from the current times of disruption to shape a more equal and sustainable world.

Within this context, this Policy Brief aims to thematically present policy options to inform decision makers developing evidence-driven public health policies and programs as well as the discussion of the Congress’ sixth plenary session entitled “Revolutionising the Public Health Workforce (PHW) as Agents of Change” (**Supplementary Table S1**) (11). Fit for purpose education and training in public health is essential for creating a PHW of dynamic agents of change who will shape future systems. In this plenary session, we asked the questions: How must education and training in public health be transformed to ensure the quality and relevance of the PHW? What actions must be taken to build knowledge and capacity in the PHW globally? (**Supplementary Tables S2, S3**).

EVIDENCE

The panel discussion revealed diverse perspectives that strongly resonated with the main themes mentioned above. Public health competencies need to be transformed through transdisciplinary education and inter-professional training including “out-of-silo experiences.” This requires dynamic and creative teaching methods incorporated into public health systems, the use of digital platforms and the creation of leaders tackling social and health inequities. Employability of graduates and early-career professionals during COVID-19 reinforces the importance of adequate competencies, educational quality, and training opportunities in order to grow. Public health civil society organizations in Europe, such as the Association of Schools of Public Health in the European Region (ASPHER) or the Association of Schools of Public Health in Africa (ASPHA), provide opportunities for young professionals to gain experience and access to professional networks.

Globally, we face a paradoxical imbalance of the health workforce both clinical and non-clinical including public health staff. This situation is often caused by the demand and supply for health workforce, health systems, policies, and available resources (12). Africa in particular suffers from a lack of job opportunities, underproduction, and a brain drain of graduates. A major part of global health training, addressing diseases relevant to LMICs, takes place in the global north. Otherwise, overproduction implies migration to other sectors and lost opportunities to create public health capacity. This implies the need for adaptable, multisectoral agents of change

by offering possibilities to succeed in other sectors in addition to sufficient funding, jobs, and training opportunities. We need to share learning within different disciplines and settings instead of a purely transferred learning. In doing so, regional contexts and conditions and their influence on health must be addressed (13).

Since education influences thinking and further development, to revolutionize public health, we must focus on transformative education (TE). According to Mezirow, transformative learning (TL) occurs when learners simultaneously receive new information and are also reflecting on past experiences to transform their world view (14). Frenk et al. (2010) observed that TL relates to the development of leadership attributes that “produce enlightened change agents” (15). This understanding positions TL as a desirable outcome of public health education and training. Apart from the *Pentavium* of humanistic and ethical competencies, education must equip public health students with relevant tools and experiences as well as business and management skills to be capable to act as global leaders within heavily marketized and corporatized public and private health systems (15).

Public health education is to be seen as a transformational discovery process instead of a product that can be purchased. It has the responsibility to empower students not only as knowledgeable employees but also to equip them with behaviorally based and measurable skills to act successfully as leaders for transformational change in their future work. Public Health training models based on eco-awareness, genuine exchange and cooperation have the potential to offer sustainable solutions to revolutionize public health (15–20).

POLICY OPTIONS AND RECOMMENDATIONS

Transforming Public Health Competencies Through Transdisciplinary Education and Interprofessional Training

“Transformative learning is about developing leadership attributes; its purpose is to produce enlightened change agents.”

According to NAF, to define the “new normal” for public health competencies we must look back at the history of education and understand how different pedagogical paradigms have shaped the development of medical and health professionals over time.

NAF described how currently there is a need for more generalist and transdisciplinary education within universities. In 1910, the *Flexner Report* resulted in the organization of health education into specializations and disciplines, with a greater focus on technological and scientific expertise (21). This represented a change from education in medieval times and in the 19th century, which was more generalist in nature and focused on a broad range of subjects such as Formal Logic, Classical Rhetoric, Arithmetic, Music, History, Mathematics, Anthropology and Philosophy.

LM and NAF emphasized that we must build interprofessionality and interdisciplinarity to tackle hyper-

specialized, fragmented and “siloed” learning models to influence complex webs of policy and governance. Both LM and NAF called for more active and creative pedagogical strategies which are integrated into public health systems, harness digital technologies, online and open education, to overcome social inequalities and health inequities. Transforming public health education means implementing transformative learning strategies focusing on leadership competencies that go beyond the provision of care, retrieving knowledge, and application of guidelines. To do this, NAF suggested a *Pentavium* of five core competencies (22):

- Linguistic competence - to be able to use the native language and the lingua franca of contemporary science.
- Training in research - analytical reasoning and interpretation skills to produce knowledge.
- Pedagogical competence - learning skills necessary to share knowledge.
- Technical - critical technological competence and mastery of the means and tools of practice and their implications.
- Sensitivity to ecosocial issues - empathy and ability to listen sensitively and be respectful of human diversity, ethics, and solidarity.

Revolutionizing Educational Systems by Shifting the Public Health Paradigm

“Now is the time to transform our educational systems”.

According to LM, the impact of COVID-19 on our educational systems provides the opportunity to rethink our public health educational models to harness new methodologies, focused on essential competencies and meet the needs of students and the workforce. We cannot go back to where we were, we need to re-envision our academic institutions, LM proposed nine key components of a transformed public health educational system, which can serve as short-term recommendations:

- Shifting from a unique event to lifelong learning in an educational system that allows multiple re-admissions and an economic system that allows, promotes, and values education and training throughout the professional career and throughout life.
- Moving from a telescopic to a kaleidoscopic approach to education with multiple entry points and diverse paths in the educational system, to increase inclusion of students with diverse backgrounds and to value lived experiences. With multiple exit points as well, to increase the diversity of opportunities after graduation.
- Pivoting from technical knowledge to core human competencies, which will develop resilient, culturally agile, and creative professionals that can adapt to ever-changing challenges.
- Switching to time variable education to enable individuals to study at any stage of their careers and at the pace that their personal and professional lives allow.

- Replacing static curricula with flexible, personalized curricula that meet the unique competency requirements of individual students.
- Incorporating experiential learning scenarios such as online courses, workshops, internships, and work experience.
- Pivoting to hybrid models. Focused online and digital learning on the development of technical knowledge and face-to-face learning focused on social, emotional, and cognitive competencies.
- Rethinking faculty roles so that they design learning scenarios, follow student performance throughout their professional careers, assess their individual readiness, and coach and mentor instead of lecture.
- Diverging away from stand-alone academia in single institutions towards global partnerships and alliances by integrating partners and practices from everywhere.

Linking Public Health Education and Work Opportunities

“We shouldn’t regard students as vessels to be filled; they are flowers to be nurtured.”

As current President of ASPHER, JM called on the public health community to enable early-career professionals to advocate for a better future society. This would require competencies in advocacy, networking, partnerships, and leadership to compliment technical knowledge. Building on this, PBA emphasized the need to harmonize curricula and competency frameworks to ensure standards for high-quality training and public health graduate production. In practice, this requires linking with public health institutions, such as the International Association of National Public Health Institutes (IANPHI) or ASPHER, to provide students with ‘real-life’ work situations. According to JM, COVID-19 has provided the opportunity for many graduates and early-career professionals to significantly contribute to vital COVID-19-related work in Europe and to accelerate the ASPHER 2025 strategy.

Overcoming the Paradoxical Shortage and Overproduction of Graduates

“COVID-19 has been a monumental employment opportunity”.

Using the example of Australia, PMV referred to an “in crowd” and an “out crowd” of graduates. Whereas the “in crowd” graduates quickly obtained significant roles, using competencies in outbreak management, coding and programming, and evidence reviews, the “out crowd” graduates remained without jobs. Some countries must scale up the health workforce production while jobs are not readily available for graduates. This relative overproduction of graduates means that we are missing an opportunity to create agents of change. On the other hand, given the example of the African region, PBA referred to an acute shortage of public health professionals, with an estimated 4.2 million additional healthcare workers required to

achieve the SDGs by 2030. This shortage was reflected in the fact that the majority of COVID-19 contact tracers have been students from public health schools. PBA noted that in Africa, as well as in Latin America, there is a general “underproduction” of health professionals. Furthermore, there is a “brain drain” as many professionals who graduated in their homeland in lower income countries migrate to higher income countries to find better working conditions. Both underproduction and brain drain are causes of a shortage of graduates around the world.

According to PBA, graduate retention is also an important issue. Many graduates leave to work in other sectors and countries, highlighting the need for increased remuneration and funding for preventive health instead of curative health. Supporting this, PMV referred to graduate employability and the need for more public health resourcing and creation of jobs, internships, and training programs.

Developing Adaptable, Multi-Sectoral Agents of Change

“To have public health impact in any sector, we need to be employable in any sector”

The COVID-19 pandemic further highlights that population health and wellbeing is hugely affected by other sectors aside from the health sector (8). Therefore, to create multisectoral impact, PMV called for a shift in thinking from employability only within the *core PHW*, towards also thinking about employability in the *wider PHW*. More sustainable funding is required for the *core PHW* around the world, however there is also potential for increasing the public health impact of the workforce outside of the sector. As a recent graduate, PMV noted that this would require public health professionals and educators to prepare dynamic and adaptable public health graduates who can work in any sector and advocate for positive public health change. This way, no matter what area of work a graduate finds themselves in, they will be able to identify potential ways to integrate public health values and concepts.

According to PMV, creating multisectoral impact would require graduates to be resilient, dynamic, ready to create and take opportunities to improve population health and wellbeing in any sector. For this, public health education must deliver fit for purpose tools, experiences, and competencies. For example, it must challenge students and recent graduates to develop interventions to complex problems, viral internet campaigns, useful apps, and research that address inequalities and creates health for all. In addition to developing competencies for the *core PHW* as well as the *wider PHW*, educational programs need to harness existing public health professionals to promote the development of agents of change through mentoring and inclusion in professional networks. PMV concluded by reminding the audience that public health is a household name now due to COVID-19 and that we must expect more interest and graduates in the future. Because of this, we must work together as a global public health community to ensure that future graduates are trained, educated, and mentored to impact public health in all their future roles across any sector.

Conclusion

There is an urgent need to transform public health education and training to ensure the quality and relevance of the PHW. Interdisciplinarity and inter-professionality must be fundamental strategies of public health education, articulating formative and informative content, which is humanistic, ethical, and technical, able to mobilize various types of knowledge and disciplines in the face of concrete challenges. However, we have to be aware that this is a long-term process due to the differences in educational systems, traditions, and understanding of the mission and role of public health and PHW in different parts of the world. Therefore, universities and educational centers, on one side, and public health institutions and healthcare organizations, on the other side, must engage to promote and exchange good practices and training processes that connect the academia, health services and communities at national and international levels (**Supplementary Table S4**).

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CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.ssph-journal.org/articles/10.3389/phrs.2023.1604807/full#supplementary-material>



Enhancing Student Wellbeing Through Social Prescribing: A Rapid Realist Review

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Objectives: A Rapid Realist Review of social prescribing in Higher Education (HE) was undertaken to determine what works, for whom, how, why, and within what circumstances. The review resulted in the development of a Realist Programme Theory articulating the way in which social prescribing can be implemented within the HE environment.

Methods: Searches of 12 electronic databases were supplemented by citation chaining and grey literature surfaced by the Project Advisory Group. The RAMESES Quality Standards for Realist Review were followed, and the retrieved articles were systematically screened and iteratively analysed to develop Context-Mechanism-Outcome Configurations (CMOCs) and an overarching Realist Programme Theory.

Results: A total of 57 documents were included. The overarching programme theory was developed from the analysis of these documents and comprised of a social prescribing pathway with the following components: (1) An Accessible Gateway, (2) A Skilled Peer, (3) Trusted-Safe-Credible Resources, and (4) A Healthy Setting.

Conclusion: A Realist Programme Theory was developed—this model and associated principles will provide a theoretical basis for the implementation of social prescribing pathways within higher education. Whilst the direct project outputs are of particular significance to the UK HE audience, the underpinning principles can support practice within the global arena.

Keywords: social prescribing, realist review, higher education, student support, wellbeing

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INTRODUCTION

Within the United Kingdom (UK), it is estimated that up to 20% of Primary Care appointments are for social or economic, rather than medical reasons [1–3]. Mental health issues are now more prevalent within the general population, a situation that has been exacerbated by the COVID-19 pandemic [4, 5]. UK policy and legislative documents have called for new and innovative services to address these challenges [6–8], indicating that resources should deliver holistic support for citizens which promote health and wellbeing.

Social prescribing is a globally evolving initiative [9] which has the potential to address these pressures and prevent future ill health. Models of social prescribing are heterogeneous and highly

complex [10, 11], varying in structure, intensity of service provision, and complexity [12]. Models typically comprise a link worker, also known as a community connector, navigator, or wellbeing advisor, who works with an individual to identify goals and needs and connect them with non-medical community resources [13, 14]. A range of models have emerged over the past decade, varying in structure, complexity, and intensity of provision [15]. Services include informal signposting to community resources and assets, through to holistic support where link workers work closely and co-productively with the individual over a series of appointments to identify resources to meet their needs [12].

Social prescribing interventions have been targeted at a range of population groups and conditions including people who are socially isolated, older individuals experiencing sensory impairment, and those with long term health issues [14, 16–20], but Higher Education (HE) students and young people remain a demographic where further investigation regarding the implementation of social prescribing is warranted. Student wellbeing levels are considerably lower than the general population [21], and marked increases in student wellbeing issues have been observed in recent years [22]. Factors including change of locality, the pressures of independent living and learning, new personal responsibilities all contribute to reduced wellbeing and challenges of adjustment are particularly amplified for mature students, those with declared disability, and learners from Black and Asian Minority Ethnic groups [21, 23–25].

In addition, the student population continue to be considerably affected by the COVID-19 pandemic, impacting on social isolation, stress, anxiety, loneliness, social interactions, and wellbeing [26–28]. Whilst several strategies have been developed [29], effectively supporting student wellbeing remains difficult. Given the struggles experienced by this specific group and the large and increasing number of individuals attending HE [25], the potential for social prescribing within this environment merits further exploration.

This Rapid Realist Review seeks to evaluate social prescribing in HE—informing the development of a service model which will effectively meet the varying needs of a range of individuals. To achieve this aim, five specific review questions were devised:

1. *What* forms of social prescribing interventions are specifically targeted at HE students?
2. *How* do HE students access social prescribing interventions targeting them?
3. *When* do HE students access social prescribing interventions?
4. *For whom* do social prescribing interventions work?
5. *To what extent* does social prescribing work for HE students?

METHODS

Conventional approaches to the evaluation of interventions such as the systematic review focus predominantly upon outcome, i.e., *what works* [30]. In order to understand how a scalable social prescribing pathway may be developed for

students in HE, it is imperative to appreciate the impact of context; to understand *how, why, for whom, to what extent, and in what context* the intervention works [31]. Realist methodology satisfies these demands; it is a theory-driven approach to the synthesis of evidence, the goal of which is to build a programme theory that explicates what the intervention is, and how it can be expected to work. The Realist Review method is grounded within generative causation, meaning that to infer a causal relationship between an intervention (I) and outcome (O), one must understand the underpinning mechanism (M) connecting them, as well as the context (C) in which they occur. Using the Realist approach, we have unpacked the Context-Mechanism-Outcome configurations (CMOCs) underpinning existing pathways, and in doing so, have built a Realist programme theory of social prescribing for students in HE.

Developing the Project Scope

Refining the focus of the review and developing scope took place collaboratively with an Advisory Group [32] comprising key student services personnel, student representatives, content experts, 3rd Sector partners, and members of the research team from across both institutions. A Population, Intervention, Comparison, Outcome (PICO), and search strategy were developed (Table 1), and informal scoping of existing evidence and policy was undertaken to pilot test search terms and build familiarity with existing knowledge relating to social prescribing. Whilst these initial searches indicated that literature focusing specifically upon the use of social prescribing with HE students was limited, examining similar interventions in which social prescribing had been employed, allowed the detection of demi-regularities [33, 34] or causal patterns that formed the basis of CMOCs within this project.

Search Strategy

An Initial Programme Theory (IPT) should be the starting point within any Realist Review—encapsulating views of the research team and Advisory Group regarding how and why an intervention should work [35]. Search terms encompassing the IPT were initially drafted in conjunction with the Advisory Group, executed, and refined iteratively as the IPT was developed. Following further consultation with an information specialist, twelve databases were searched (Table 1). Grey literature obtained from Local Authority and 3rd Sector websites from the UK were additionally interrogated, and further documents were provided by the Advisory Group. Citation chaining was also used to identify other relevant documents throughout the review; however given that a Rapid Realist Review was being undertaken [36], there were limited opportunities to add documents to the review in this way. The search results were exported and de-duplicated within EndNote X9 (Clarivate Analytics, Philadelphia PA, USA) before being fully extracted into Microsoft Excel (Microsoft Corporation, Redmond WA, USA) for the research team to have full access. A PRISMA diagram outlining the search is presented within Figure 1.

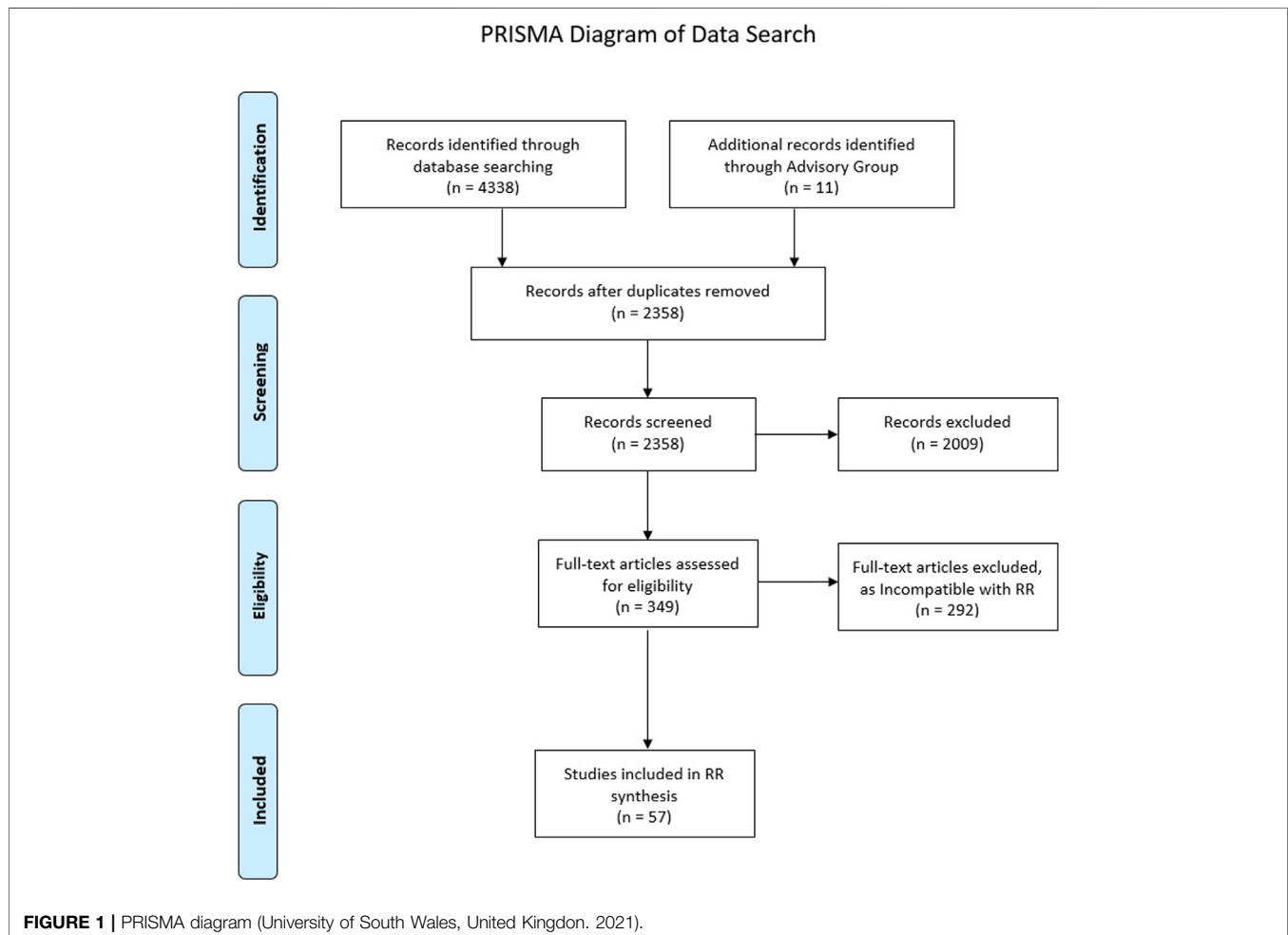
TABLE 1 | PICO & Literature Searches (University of South Wales, United Kingdom. 2022).**PICO framework**

Patient/Population Under Study	HE Students
Intervention	Social Prescribing
Comparison	Students sourcing own wellbeing interventions
Outcome	Impact of specified Social Prescribing model upon overall student wellbeing
Search Terms	
Search Term	Alternate
Wellbeing	Wellbeing, Wellbeing, Wellness,
Resilience	Resilien*, Hardiness, Reserve, Coping,
Isolation	Isolat*, Separat*, Lonel*, Remot*, Living Away, Social Isolation
Relationships	Relationship*, Connection*,
Local Community	Locality, Neighbourhood, Community Group,
Lifestyle	Physical Health, Mental Health, Healthy Living,
Social Prescribing	Social Prescr*, Link Worker*, Link Navigator, Link Coordinator, Community Refer*, Community Connect*, Community Coordinator, Community Navigator, Community Champion, First Contact Practitioner, Local Area Coordinator, Social Capital, Community Asset*,
Student	Student*, Learner*, Part-time Student*, Rural Student*, Liberation Groups, Mature Student*, Students with Declared Disabil*,
Higher Education	HE, FE in HE, University, Tertiary Education
Self-Efficacy	Self-Management
Literature Sources	
Documents	
Primary Care Hub (2018) Social Prescribing in Wales: Final Report. Cardiff: Public Health Wales	
Social Services and Wellbeing (Wales) Act 2014	
Wellbeing of Future Generations (Wales) Act, 2015	
Welsh Government (2018) A Healthier Wales: Our Plan for Health and Social Care. Cardiff: Welsh Government	
Databases	
ASSIA, British Education Index, CINAHL, ERIC, Medline, ProQuest Psychology Journals, PsychInfo, PubMed, Science Direct, Scopus, Social Care Online, Web of Science	
Grey Literature	
Local Authority Websites, Third Sector Websites, University Websites, HE Sector Policy Documents, 'OpenGrey'	
Inclusion & Exclusion Criteria	
Inclusion	Exclusion
English language	Students in FE or Continuing Education
Published literature	
Grey literature	
Students in HE	
Date Range	
All available entries up to April 2020	
Search Strings	
Concept 1 Wellbeing	
Wellbeing OR "Wellbeing" OR "Wellbeing" OR Wellness	
Concept 2 Resilience	
Resilien* OR Hardiness OR Reserve OR Coping	
Concept 3 Isolation	
Isolat* OR Separat* OR Lonel* OR Remot* OR "Living Away" Or "Social Isolation"	
Concept 4 Relationships	
Relationship* OR Connection*	
Concept 5 Local Community	
"Local Community" OR Locality OR Neighbourhood OR "Community Group"	
Concept 6 Lifestyle	
Lifestyle OR "Physical Health" OR "Mental Health" OR "Healthy Living"	
Concept 7 Social Prescribing	
"Social Prescr*" OR "Link Worker*" OR "Link Navigator" OR "Link Coordinator" OR "Link Co-ordinator" OR "Community Refer*" OR "Community Connect*" OR "Community Coordinator" OR "Community Co-ordinator" OR "Community Navigator" OR "Community Champion" OR "First Contact Practitioner" OR "Local Area Coordinator" OR "Local Area Co-ordinator" OR "Social Capital" OR "Community Asset"	
Concept 8 Student	
Student* OR Learner* OR "Part-Time Student*" OR "part time student*" OR "Rural Student*" Or "Liberation Groups" OR "Mature Student*" OR "Students with Declared Disabil"	
Concept 9 Higher Education	
"Higher Education" OR HE OR "FE in HE" OR "Tertiary Education" OR University NOT FE	
Concept 10 Self Efficacy	
"Self Efficacy" OR "Self-Efficacy" OR "Self Management" OR "Self-Management"	
Search Outcomes	

(Continued on following page)

TABLE 1 | (Continued) PICO & Literature Searches (University of South Wales, United Kingdom. 2022).**PICO framework**

Total Hits	4,338
Duplicates Removed	2,347
Including Grey Literature from Advisory Group	2,358
For Abstract Screen	349



Selecting Documents

Documents were selected based on the degree to which they addressed the research questions, and ultimately contributed to the development of a Refined Programme Theory. Inclusion decisions were made by the full review team based upon *relevance* - how these data might contribute to theory building, and *rigour*—the degree to which the methods used to generate these data are plausible and trustworthy [34]. Titles retrieved from the searches were initially screened by MD for salience; any deemed irrelevant were excluded at this stage. An abstract screening tool was developed by the project team and utilised to screen the

remaining documents and determine if they met the inclusion criteria (**Table 1**). Where it was unclear if the abstracts met the inclusion criteria, the full text document was retained for screening. Abstract screening was undertaken by MD and CW; ME ensured inter-rater reliability by screening 10% of the overall abstracts. Full text screening was completed by MD and CW to establish the final data set for inclusion, and this was transferred to NVivo 12 (QSR International, Warrington, UK) for coding. Again, 10% of the documents were screened by ME, and any disagreements were resolved through engagement and discussion with the project Advisory Group.

Existing evidence was interrogated to further confirm, refine or refute the IPT, leading to the development of an abstracted model explaining how and why our programme works, for whom, to what extent, and in what circumstances [34]. Through an iterative process of data collection, analysis and synthesis [32], CMOCs were built that continued to shape the emerging programme theory. Whilst qualitative appraisal frameworks such as the *CASP Qualitative Studies Checklist* [37] may have significant utility within conventional systematic reviews, they must be applied cautiously in a Realist Review in order to avoid excluding documents which could significantly impact upon programme theory development [32] - even documents that lack methodologically robustness may still potentially contain “nuggets” that could advance the theory building process [38]. Discussing the content of any potentially problematic document within the research team and Advisory Group was helpful in this respect, as was following the *RAMESES Quality Standards for Realist Synthesis* [39] and selecting literature that provided ‘conceptually rich’ accounts of phenomena [40].

Extracting and Organising the Data

Once the data set was finalised (Table 2), full text documents were sourced and located within a shared drive accessible by all team members and transferred to NVivo 12 (QSR International, Warrington, UK) for coding. A data extraction tool using Microsoft MS Excel (Microsoft Corporation, Redmond WA, USA) was also employed to collate information regarding the authors, date, source, nature of intervention, potential CMOCs, overall themes and any reference to substantive theory.

Synthesizing the Evidence and Building the Programme Theory

Full text was first examined by MD who identified initial themes or tentative ‘bucket codes’ that may reflect a Context, Mechanism, Outcome, or any combination of these. This process continued iteratively as CMOCs were developed, allowing the emerging Programme Theory to be supported, refined, or refuted. CW simultaneously double coded 20% of the data set and both reviewers discussed and agreed the emerging CMOCs. The process was further supported by ME, who was involved in all discussions regarding coding, the development of CMOCs, and the Refined Programme Theory.

The initial bucket codes remained very broad but proved to be a useful stepping-stone as we transitioned from analysis to synthesis. Three key reasoning strategies were employed synergistically to facilitate data analysis, synthesis, and theory building. Careful “observation” of the data resulted in the *inductive* generation of codes, whilst themes or propositions from the initial programme theory/substantive theory were tested against the data in a *deductive* manner to build CMOCs. Finally, *retroductive* reasoning involved using both induction and deduction as well as drawing on one’s own insights in a manner consonant with the abductive reasoning of Peirce [41] in order to elucidate causal mechanisms [42]. A full list of CMOCs can be found within Table 3.

RESULTS

Document Characteristics

Overall, 57 documents were included in this Realist Review; none made explicit reference to social prescribing pathways operating within higher education. A range of mental health and wellbeing interventions were however identified; some of these functioned in isolation, whilst others were part of a broader initiative. Documents were from the United Kingdom ($n = 18$), United States ($n = 17$), Europe ($n = 10$), Australia ($n = 6$), Canada ($n = 2$), Asia ($n = 2$), Russia ($n = 1$) and Iran ($n = 1$).

Main Findings

The focus of this review was to develop a programme theory explicating how social prescribing might be most optimally introduced to maximise benefit for both those using the services, and the organisations within which the pathways are hosted. Whilst literature relating directly to the use of social prescribing for HE students was limited, several studies articulated processes or pathways that were analogous to elements of the social prescribing process. Examples included using digital systems that linked those with wellbeing or mental health issues with services, mapping assets or resources within the university or wider community, and providing those undertaking a link worker role with effective training and support. Developing CMOCs from the literature also provided opportunities to examine social prescribing pathways created for other groups, e.g., older people living with chronic conditions, identifying demi-regularities [33, 34] that informed the programme theory developed within this project. Analysis of the data surfaced a programme theory in which four specific themes were supported by CMOCs, i.e., *An Accessible Gateway*, *A Skilled Peer*, *Trusted-Safe-Credible Resources*, and *a Healthy Setting*.

An Accessible Gateway

When examining the literature surrounding systems or pathways for those experiencing mental health or wellbeing issues, the issue of routes into support begin to clearly surface as both an issue, and an area for careful consideration. The need for an accessible provision delivered both physically and virtually emerge as a means of reducing stigma associated with services, sharing resources, and (through a process of sharing experiences) developing positive coping strategies [11]. When services are delivered conventionally, students may find accessing these more difficult, particularly if they are not living on campus and only physically attend for limited periods during a week—issues that are further amplified in the current COVID-19 pandemic period. Web-based provision that includes an automated component may be useful in providing support for these groups [43, 44]. The range of provision is not always readily discernible when users are initially attempting to access the pathway, and this can be particularly problematic if services are offered by a range of departments within the university and beyond.

This issue was highlighted in a study examining the inception of social prescribing pathways within Primary Care, indicating that in order to increase engagement for all stakeholders,

TABLE 2 | Final Data Set (University of South Wales, United Kingdom. 2022).

Authors	Date	Article title	Country	Study design	Sample/Setting	Objectives
Abbas, M. A. Eliyana, P. A. Ekowati, D. D. Saud, M. M. Raza, M. A. Wardani, M. R.	2020	Data set on coping strategies in the digital age: The role of psychological wellbeing and social capital among university students in Java Timur, Surabaya, Indonesia	Indonesia	Survey questionnaire	University students	To examine the effects of technology on coping strategies & psychological wellbeing
Agadullina, E. R. Lovakov, A. Kiselnikova, N. V.	2020	Does quitting social networks change feelings of loneliness among freshmen? An experimental study	Russia	Experimental design	Freshman psychology students	To examine the impact of quitting social networks upon loneliness and isolation
Alizadeh, Z. Safaian, A. Mahmoodi, H. Shaghaghi, A.	2018	Pathways between authentic happiness and health promoting lifestyle profiles of the university students in Tabriz, Iran	Iran	Cross-sectional study	Iranian university students	To explore the relationship between and other health promoting behaviours
Altinyelken, H. K.	2018	Promoting the psychosocial wellbeing of international students through mindfulness: A focus on regulating difficult emotions	Netherlands	Qualitative study	International students at a Dutch university	To explore the potential of a mindfulness programme for providing psycho-social support to international students in higher education
Anderson, S. Fast, J. Keating, N. Eales, J. Chivers, S. Barnett, D.	2017	Translating knowledge: Promoting health through intergenerational community arts programming	Canada	Community participatory research project	Older adults and university students	To explore the health and wellbeing benefits of participation in an intergenerational community arts programme
Ashbaugh, K. Koegel, R. Koegel, L.	2017	Increasing social integration for college students with autism spectrum disorder	United States	Experimental design	University students with a confirmed diagnosis of Autistic Spectrum Disorder	To assess whether a structured social planning intervention would increase social integration for college students with Autistic Spectrum Disorder
Bailey, K. M. Frost, K. M. Casagrande, K. Ingersoll, B.	2020	The relationship between social experience and subjective wellbeing in autistic college students: A mixed methods study	United States	Mixed methods study	University students who had identified themselves to the college's disability resource centre	To explore the relationship between the college social experience and subjective wellbeing in autistic student in the Midwestern United States
Barsell, D. J. Everhart, R. S. Miadich, S. A. Trujillo, M. A.	2018	Examining health behaviours, health literacy, and self-efficacy in college students with chronic conditions	United States	Survey questionnaire	Undergraduate students from a Mid Atlantic US university with a self-identified chronic health conditions lasting >3 months	To examine associations between health literacy, self-efficacy, and health behaviours in a sample of college students with chronic conditions
Bertotti, M. Frostick, C. Hutt, P. Sohanpal, R. Carnes, D.	2018	A Realist Evaluation of social prescribing: an exploration into the context and mechanisms underpinning a pathway linking primary care with the voluntary sector	United Kingdom	Realist Evaluation	Users of social prescribing services	To use a Realist approach in order to evaluate a social prescribing pilot in the areas of Hackney and City in London.
Bird, A. Pincavage, A.	2016	A curriculum to foster resident resilience	United States	Case study	Medical students	To evaluate the impact of a 'resilience curriculum' upon resilience and wellness
Boda, Z. Elmer, T. Voros, A. Stadtfeld, C.	2020	Short-term and long-term effects of a social network intervention on friendships among university students	Switzerland	Field experiment & observational study	Undergraduate university students	To investigate the short-term and long-term effects of randomized first contact opportunities on friendship networks in an emerging community of first-year undergraduate students

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TABLE 2 | (Continued) Final Data Set (University of South Wales, United Kingdom. 2022).

Authors	Date	Article title	Country	Study design	Sample/Setting	Objectives
Bouteyre, E. Maurel, M. Bernaud, J.	2006	Daily hassles and depressive symptoms among first year psychology students in France: The role of coping and social support	France	Survey questionnaire	First year undergraduate university students	To explore the impact of coping strategies upon daily hassles and depressive symptoms
Brunsting, N. C. Zachry, C. Liu, J. Bryant, R. Fang, X. Wu, S. Luo, Z.	2019	Sources of perceived social support, social-emotional experiences, and psychological wellbeing of international students	United States	Structural equation modelling	Graduate and undergraduate students	To test whether specific social influences could enhance international students' belonging and wellbeing and attenuate loneliness
Budzynski-Seymour, E. Conway, R. Wade, M. Lucas, A. Jones, M. Mann, S. Steele, J.	2020	Physical activity, mental and personal wellbeing, social isolation, and perceptions of academic attainment and employability in university students: The Scottish and British active students' surveys	United Kingdom	Cross sectional surveys	University and college students in Scotland and the United Kingdom	To explore the relationships between physical activity and personal wellbeing within UK university students
Byrom, N.	2018	An evaluation of a peer support intervention for student mental health	United Kingdom	Cohort study	Students within 8 UK universities	To identify students likely to attend peer support and evaluate the acceptability and impact of the intervention
Chandler, G. E. Kalmakis, K. A. Chiodo, L. Helling, J.	2020	The efficacy of a resilience intervention among diverse, at-risk, college athletes: a mixed-methods study	United States	Mixed methods study	US college athletes	To assess the efficacy of a strengths-based resilience intervention upon perceptions of stress, resilience, emotional awareness, and belonging among student-athletes.
Chow, K. M. Tang, W. K. Chan, W. H. Sit, W. H. Choi, K. C. Chan, S.	2018	Resilience and wellbeing of university nursing students in Hong Kong: A cross sectional study	China	Cross sectional descriptive correlation design	Chinese undergraduate nursing students	To explore resilience levels in nursing students and its relationship with wellbeing
Karishma, C. Armstrong, S. Bean, S.	2018	Supporting students facing mental health challenges	United States	Survey questionnaire	Graduate and undergraduate students	To assess anxiety levels in university students and consider potential support strategies
Daddow, A. Cronshaw, D. Daddow, N. Sandy, R.	2019	Hopeful cross-cultural encounters to support student wellbeing and graduate attributes in Higher Education	Australia	Qualitative programme evaluation	University students	To evaluate an extracurricular programme that enabled interfaith and cross-cultural dialogue
Denovan, A. Macaskill, A.	2017	Stress, resilience and leisure coping among university students: Applying the broaden-and-build theory	United Kingdom	Structural equation modelling	University students	To investigate whether resilience predicts leisure coping and positive affect and whether this relationship is predictive of higher levels of wellbeing
Donoghue, J. O'Rourke, M. Hammond, S. Stoyanov, S. O'Tuathaigh, C.	2020	Strategies for enhancing resilience in medical students: a Group Concept Mapping analysis	Ireland	Group Concept Mapping analysis	Undergraduate medical students	To use GCM software to explore and categorise resilience strategies employed by third year undergraduate medical students
Dunn, L. B. Moutier, C.	2008	A conceptual model of medical student wellbeing: Promoting resilience and preventing burnout	International	Literature Review	Undergraduate medical students	To review the literature on medical student stress, coping, and wellbeing in order to develop a model of medical student coping termed the "coping reservoir."

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TABLE 2 | (Continued) Final Data Set (University of South Wales, United Kingdom. 2022).

Authors	Date	Article title	Country	Study design	Sample/Setting	Objectives
Enrique, A. Mooney, O. Salamanca-Sanabria, A. Lee, C. T. Farrell, S. Richards, D.	2019	Assessing the efficacy and acceptability of an internet-delivered intervention for resilience among college students: A pilot randomised control trial protocol	Ireland	Randomised control trial (protocol)	University students	To evaluate a newly developed internet-delivered intervention for resilience provided with human or automated support
Galante, J. Dufour, G. Vainre, M. Wagner, A. P. Stochl, J. Croudace, T. J. Benton, A. Howarth, E. Jones, P. B.	2016	Provision of a mindfulness intervention to support university students' wellbeing and resilience to stress: preliminary results of a randomised controlled trial	United Kingdom	Randomised control trial	University students	To assess the efficacy of an 8 week mindfulness course versus usual mental health provision
Gee, K. A. Hawes, V. Cox, N. A.	2019	Blue Notes: Using songwriting to improve student mental health and wellbeing. A pilot randomised controlled trial	United Kingdom	Wait-list randomised control trial	University students with self-identified anxiety	To assess the efficacy of a weekly songwriting programme versus no intervention
Gieck, D. J. Olsen, S.	2007	Holistic wellness as means to developing a lifestyle approach to health behaviour among college students	United States	Cohort study	University students	To examine the influence of a holistic model of wellness on activity level among obese and sedentary college students
Haas, J. Pamulapati, L. G. Koenig, R. A. Keel, V. Ogbonna, K. C. Caldas, L. M.	2020	A call to action: Pharmacy students as leaders in encouraging physical activity as a coping strategy to combat student stress	United States	Commentary paper	Undergraduate pharmacy students	This commentary is a call to action for student pharmacists to take shared ownership over improving the current crisis of student wellbeing - empower their students to guide the improvement of wellness.
Rand Health	2016	Campus Climate Matters: Changing the Mental Health Climate on College Campuses Improves Student Outcomes and Benefits Society.	United States	Research brief	University students	To discuss a CalMHSA prevention & early intervention programme targeting health and wellbeing
HEFCW	2019	HE for a Healthy Nation: Student Wellbeing and Health	United Kingdom (Wales)	Report	University students	Report examining a range of student wellbeing strategies.
Harrer, M. Adam, S. H. Baumeister, H. Cuijpers, P. Karyotaki, E. Auerbech, R. P. Kessler, R. C. Bruffaerts, R. Berking, M. Ebert, D. D.	2019	Internet interventions for mental health in university students: A systematic review and meta-analysis	International	Systematic review and meta-analysis	University students	To search for randomized trials examining psychological interventions for the mental health, well-being, and functioning of university students
Herrero, R. Adriana, M. Giulia, C. Etchemendy, E. Banos, R. Garcia-Palacios, A. Ebert, D. D. Franke, M. Berger, T. Schaub, M. P. Goerlich, D. Jacobi, C. Botella, C.	2019	An Internet based intervention for improving resilience and coping strategies in university students: Study protocol for a randomized controlled trial	International	Randomised control trial (protocol)	University students	To evaluate the efficacy of an unguided internet-based intervention to enhance resilience in university students
Holt, M. Powell, S.	2017	Healthy Universities: a guiding framework for universities to examine the distinctive health needs of its own student population	United Kingdom	Survey questionnaire	University students	To examine the student health behaviours of one university so that future initiatives can be tailored to its own student population

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TABLE 2 | (Continued) Final Data Set (University of South Wales, United Kingdom. 2022).

Authors	Date	Article title	Country	Study design	Sample/Setting	Objectives
Husk, K. Blockley, K. Lovell, R. Bethel, A. Lang, I. Byng, R. Garside R.	2019	What approaches to social prescribing work, for whom, and in what circumstances? A Realist Review	United Kingdom	Realist Review	Users of social prescribing services	To develop a programme theory articulating the ways in which social prescribing works, for whom, and in what circumstances
Hussain, R. Guppy, M. Robertson, S. Temple, E.	2013	Physical and mental health perspectives of first year undergraduate rural university students	Australia	Survey questionnaire	Rural university students	To examine the physical and mental health issues for first year Australian rural university students and their perception of access to available health and support services
Kampel, L. Orman, J. O'Dea, B.	2017	E-mental health for psychological distress in university students: A narrative synthesis on current evidence and practice	Australia	Narrative synthesis	University students	To outline the current knowledge and application of e-mental health programs, and to discuss ways that prevention and intervention programs delivered via the Internet and smartphones can be taken to scale to reach a larger number of students to improve their mental health
Knight, A. LaPlaca, V.	2013	Healthy Universities: taking the University of Greenwich Healthy Universities Initiative forward	United Kingdom	Commentary paper	University students	The paper sets out the background to the national Healthy Universities initiative, briefly outlines a pilot initiative; and ends by considering the broader developments in policy and practice
Lattie, E. G. Adkins, E. C. Winquist, N. Stiles-Shields, C. Wafford, E. Graham, A. K.	2019	Digital mental health interventions for depression, anxiety, and enhancement of psychological wellbeing among college students: systematic review	International	Systematic review	University students	To review the literature on digital mental health interventions focused on depression, anxiety, and enhancement of psychological wellbeing among samples of college students to identify the effectiveness, usability, acceptability, uptake, and adoption of such programs
Montagni, I. Cosin, T. Sagara, J. A. Bada-Alonzi, J. Horgan, A.	2020	Mental health-related digital use by university students: a systematic review	International	Systematic review	University students	To summarize and critique studies of mental health-related digital use by students worldwide, to support the implementation of future digital mental health interventions targeting university students.
Murr, A. H. Miller, C. Papadakis, M.	2002	Mentorship through advisory colleges	United States	Case study	Medical students	To outline the development and implementation of an advisory college system that supports medical student wellbeing
Oades, L. G. Robinson, P. Green, S. Spence, G. B.	2011	Towards a positive university	Australia	Commentary paper	University students	The paper explores the concept of the "Positive University."

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TABLE 2 | (Continued) Final Data Set (University of South Wales, United Kingdom. 2022).

Authors	Date	Article title	Country	Study design	Sample/Setting	Objectives
Owens, A. R. Loomes, S. L.	2010	Managing and resourcing a program of social integration initiatives for international university students: what are the benefits?	Australia	Mixed methods	International students studying at Australian universities	To report the results of a survey of 446 CQUniversity international students who have had access to enhanced social integration opportunities for integration as well as a focus-group discussion with staff and students
Palma-Gomez, A. Herrero, R. Banos, R. Garcia-Palacios, A. Castaneiras, C. Fernandez, G. L. Lull, D. M. Torres, L. C. Barranco, L. A. Cardenas-Gomez, L. Botella, C.	2020	Efficacy of a self-applied online program to promote resilience and coping skills in university students in four Spanish-speaking countries: study protocol for a randomized controlled trial	International	Randomised control trial (protocol)	University students	To evaluate the efficacy of an unguided internet-based intervention to enhance resilience in university students
Papadatou-Pastou, M. Campbell-Thomas, L. Barley, E. Haddad, M. LaFarge, C. McKeown, E. Simeonov, L. Tzotzoli, P.	2019	Exploring the feasibility and acceptability of the contents, design, and functionalities of an online intervention promoting mental health, wellbeing, and study skills in Higher Education students	United Kingdom	Cohort study	Graduate and undergraduate students	To evaluate the effectiveness of this intervention protocol in comparison with an active control condition targeting healthy lifestyle, and a waiting list control condition
Primary Care Hub	2018	Social Prescribing in Wales: Final Report	United Kingdom (Wales)	Report	Users of social prescribing services	A report providing an overview of the evolution, efficacy, and implementation challenges of social prescribing in Wales
Randstad	2020	A Degree of Uncertainty: Student Wellbeing in Higher Education	United Kingdom	Survey	University students	To explore the perceptions of students regarding their perceived levels of support whilst studying in UK universities
Ray, E. C. Arpan, L. Oehme, K. Perko, A. Clark, J.	2019	Helping students cope with adversity: a test of the influence of a web-based intervention on students' self-efficacy and intentions to use wellness-related resources	United States	Randomised control trial	Undergraduate university students	To assess the efficacy of an online student wellness intervention versus usual provision
Short, B. Lambeth, L. David, M. Ryall, M. A. Hood, C. Pahawatta, U. Dawson, A.	2019	An immersive orientation programme to improve medical student integration and wellbeing	United States	Mixed methods	Medical students	To evaluate an immersive orientation programme aimed at promoting student wellbeing through social connectedness
Sibley, S. Sauers, L. Daltrey, R.	2019	Humanity and Resilience Project: The development of a new outreach program for counselling centres at colleges and universities	United States	Case study	University students	To present an overview of a programme developed to increase resilience by encouraging social connection within students at a US university
Stalman, H. M.	2019	Efficacy of the My Coping Plan mobile application in reducing distress: A randomised controlled trial	Australia	Randomised control trial	University students with self-reported elevated levels of distress	To assess the efficacy of an online strengths-focused coping plan app versus usual provision

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TABLE 2 | (Continued) Final Data Set (University of South Wales, United Kingdom. 2022).

Authors	Date	Article title	Country	Study design	Sample/Setting	Objectives
Thomas, K. Bendsten, M.	2019	Mental Health Promotion Among University Students Using Text Messaging: Protocol for a Randomized Controlled Trial of a Mobile Phone-Based Intervention	Sweden	Randomised control trial (protocol)	University students	To test the efficacy of a mobile phone-based intervention on positive mental health
Thomas, S. S.	2009	Top 10 Strategies for Bolstering Students' Mental Resilience	United States	Commentary paper	University students	Commentary paper outlining a series of strategies that may be effective in increasing student resilience levels
Thorley, C.	2017	Not by Degrees: Improving Student Mental Health in the UK's Universities	United Kingdom	Report	University students	A report outlining setting forth the challenges surrounding student mental health and wellbeing, and outlining a series of interventions that may be helpful in addressing these
Tierney, S. Wong, G. Roberts, N. Boylan, A. Park, S. Abrams, R. Reeve, J. Williams, V. Mahtani, K. R.	2020	Supporting social prescribing in primary care by linking people to local assets: a Realist Review	United Kingdom	Realist Review	Users of social prescribing services	To understand how such social prescribing connector schemes work, for whom, why and in what circumstances
Wawera, A. S. McCamley, A.	2019	Loneliness among international students in the UK	United Kingdom	Mixed methods	International students at UK universities	To explore loneliness in an international student population in a single university
Webster, N. L. Oyeboode, J. R. Jenkins, C. Bicknell, S. Smythe, A.	2020	Using technology to support the emotional and social wellbeing of nurses: A scoping review	United Kingdom	Scoping review	Undergraduate nursing students	To review the literature on the use of technology to offer emotional and social support to nurses
Welsh Government	2018	A Healthier Wales: Our Plan for Health and Social Care	United Kingdom (Wales)	Strategy Document	Population of Wales	The document sets out a long term future vision of a whole system approach to health and social care which is focussed upon health and wellbeing, and on preventing illness
Wiljer, D. Johnson, A. McDiarmid, E. Abi-Jaoude, A. Ferguson, G. Hollenberg, E. Van Heerwaarden, N. Tripp, T. Law, M.	2017	Thought Spot: Co-Creating Mental Health Solutions with Post-Secondary Students	Canada	Case study	University students	To explore the development, utilisation, and impact of a web-based platform that supports students in seeking mental health and wellbeing support

pathways should be integrated with existing systems as far as is reasonably practicable [11].

The range of mental health and wellbeing resources continues to increase [45], but those wishing to use the services may not be aware of the scope of provision, or appropriateness of pathways; a single platform in which these are located may be particularly useful in this respect [44, 46].

A number of documents in the review highlight the stigma associated with formally seeking support [24, 47–51], and this is increased for international students, or those from deprived socio-economic backgrounds [52]. These CMOCs indicate that digital or web-based resources may be particularly

useful in ameliorating this issue, empowering students to access support without fear of negative perceptions or judgements.

Discussions around accessibility within the literature focus predominantly upon digital or web-based resources, but CMOCs within this theme also relate to the physical location, highlighting a number of considerations for any physical hubs [49]. Whilst there is a need to mirror digital provision in terms of centralising information regarding resources, the data also highlight the role that fellow students can play in raising awareness of wellbeing resources. Although physically locating student wellbeing services in one physical space may be convenient, the literature suggests

TABLE 3 | CMOC List (University of South Wales, United Kingdom. 2022).

Theme	CMOC No (Paper):	CMOC
Accessible Gateway	23	When interventions and/or services are perpetually available online (C), Students feel that there is always support (M), and this increases their sense of safety and overall wellbeing (O)
	49	When students have access to an app that enables them to view a range of alternative wellbeing provision (C), They will engage with healthy coping resources (M) and develop an individual coping plan (O)
	57	When a Social Prescribing pathway is linked to existing IT platforms (C), stakeholders will perceive it as easy to use (M) and engage more readily (O)
	38	When services provide HE students who are vulnerable with useful digital resources (C) they are more likely to engagement with these (O), because they do not feel judged or stigmatised by anyone (M)
	46	When web-based interventions link students into campus resources (C), the students feel less stigmatized (M), and there is greater uptake of Mental Health and Wellbeing services
	29	When resources are made available on-site simultaneously from the university and other partners (C), students feel a greater sense of agency (M) becoming aware of the support available (O)
	29	When student wellbeing champions are present at high traffic student 'hotspots' (C), there is a sharing of resources (M), an increased awareness of the help that is available (O)
Skilled Peer	51	When the student is confident that their needs will be met (M) by a <i>Gatekeeper's</i> knowledge of early interventions (C), they will engage with the service (O)
	57	When navigators demonstrate a genuine desire to help by offering personalised support (C), users will believe that they can benefit from the interaction (M) and engage with the service and subsequent Social Prescription (O)
	52	When trusted friends, tutors and parents are involved when students are struggling with wellbeing (C), there is a normalising of stressful experiences (M) and a subsequent building of resilience and improved wellbeing (O)
	57	When establishing the Social Prescribing pathway (C), third sector and community services will buy into the navigator role (O), if they believe that the referrals received are appropriate (M)
	57	When a user perceives the navigator to be part of a formal mental health or social services structures (C), a fear of stigmatising (M) may prevent them engaging with the services (O)
	52	When peer support is provided by student volunteers (C), there is an externalising of MH and wellbeing issues (M), and students deal more effectively with mental health & wellbeing challenges (O)
	16	When student volunteers provide wellbeing peer support (C), they share coping strategies (M), building and maintains positive mood (O)
	27	When students engage in peer-led wellness activities (C), they feel a shared connection and view the activities to be authentic and trustworthy (M), and this increases engagement (O)
	57	Developing systems providing supervision or peer support (C), enables anxieties regarding the role to be shared and explored (M), buffering the psychological pressure the navigator may experience (O)
Trusted-Safe-Credible Resources	38	When credible digital resources are provided (C) students will have confidence and trust in them (M) with consequent high levels of uptake and sustained engagement (O)
	34	When a library of online self-help resources is provided (C), students will believe that self-improvement is possible (M), and their agency and self-efficacy will increase (O)
	56	When students digitally curate community-based wellbeing resources (C), they share their knowledge with peers (M), building support networks and increasing social capital
	07	When students and older community members come together and collaborate on a shared activity (C), social connections are built between the university and wider community (M), and there is increased social capital and associated wellbeing for all parties (O)
	58	When a referral is made to a community asset (C), the service user has opportunities to meet and share experience with those within and beyond the university (M), building their social capital
	57	When developing a Social Prescribing pathway (C), third sector and community services should be active co-producers of the scheme (M), as this enables them to feel like valued partners (O)
A Healthy Setting	36	When organisations adopt a settings-based approach in which university structures, policies, and processes are integrated with wider community health promotion (C), members will feel empowered to make healthy choices within a supportive environment (M), resulting in increased satisfaction & productivity for the whole university community (O)
	28	When organisations create a positive and enabling campus environment where mental health and wellbeing are supported (C), Students feel confident that they will not be stigmatized for accessing support (M) and engage readily with campus services (O)
	32	When organisations using a Healthy University approach (C), identifying the needs of their specific student populations (M), relevant programmes and interventions are developed (O)

that locating peers with knowledge of wellbeing resources within student-centric spaces such as cafés, libraries, or social learning spaces may increase fluency with the services that are available within and potentially beyond the institution [49].

A Skilled Peer

The second theme emerging from this review focuses upon those facilitating the social prescription. The link worker or navigator role is complex, multifaceted, and continually evolving [15, 53],

requiring a wide range of attributes including mental health first aid, safeguarding, advanced interpersonal skills and motivational interviewing, in addition to a comprehensive knowledge of the resources available locally [10, 54]. There is also significant variation in scope, ranging from the “signposting” of services through to a “holistic” model involving significant engagement with clients and intense support throughout the pathway [12]. The CMOCs developed within this theme reflect these challenges—highlighting the knowledge of the navigator, and the importance of trust and confidence in building a supportive relationship between user and link worker [11, 55]. Such attributes are not only integral in building relationships with users of the social prescribing pathway. In order to achieve “Buy In” from those who receive the referral, the navigator must also be viewed as skilled, competent, and capable of generating appropriate referrals to services [11].

When developing a social prescribing pathway within this setting, the value of peer involvement also emerges strongly; the sense of connection and sharing of a common experience translating into the normalising of mental health and wellbeing issues, and development of resilience [52]. The literature also surfaces the potentially stigmatising effect of engagement with conventional mental health services, indicating that a less ‘formal’ pathway with peer involvement may ameliorate this issue.

Peer input into a social prescribing pathway is viewed as accessible & authentic, facilitating the externalisation of wellbeing issues, and affording a sharing of coping strategies with the pathway user [56, 57].

Whilst the potential efficacy of a peer-led service is supported by the data, the literature also recognises not only the need for effective training, but the potential psychological pressure associated with the navigator role—with processes such as clinical supervision highlighted as important in buffering against these [11]. The review indicates that those undertaking the navigator role must be able to facilitate trusting relationships with those using the services and possess a knowledge of the available interventions. They must also have the ability to select interventions that are appropriate for each user of the pathway; failing to do this effectively will result in a loss of “buy in” and reduced engagement not only from users of the service, but also those providing social prescribing assets within the wider community. The potential psychological burden for those undertaking the navigator role is acknowledged, and buffering systems must be in place. The review data advocates peer involvement within a pathway, but how this may be operationalised is less clear given the issues around training and support.

Trusted-Safe-Credible Resources

The literature and associated CMOCs here illustrate not only the importance of developing a pathway that is accessible and facilitated by an individual with a specific set of attributes, but also the quality of resources and assets that a user may be linked with. A basic web search for wellbeing or mental health resources will generate a significant number of hits, and the nature, scope, and quality of these is particularly challenging

for those seeking support [50, 58]. Therefore, a need for resources that have been in some way curated and legitimised emerges from the review. Having access to resources that are perceived as being trustworthy not only increases engagement with services, but also contributes to an individual’s sense of agency and self-efficacy [59]. Consonant with findings in earlier themes, peer involvement within this curation process also emerges as being important for both resource sharing and network building—which then contributes to an increase in the social capital of individuals [46]. Other CMOCs supporting this theme relate to co-productive activity involving both users of the service and those providing assets and resources beyond the university. Cultivating these wider support networks increases the social capital of pathway users, embeds the university within the broader community, and acknowledges and values the contributions of partners [11, 60, 61].

This broader relationship between CMOCs may be perceived within this theme. Co-productive working between the university and wider asset/resource providers not only brings those *using* services together, but also fosters closely working relationships between those *delivering* them—developing networks, building social capital, and fostering a common sense of value and ambition. Providing credible resources that are peer-collated and shared, further contributes to this network building whilst increasing agency and overall self-efficacy for those using the pathway.

A Healthy Setting

The final theme emerging from the review focuses upon the macro level institutional climate, articulating how this may impact upon the implementation and ongoing operation of a social prescribing pathway. A number of CMOCs developed echo the “Settings-based Approach” to health promotion outlined within the *Ottawa Charter* [62], and the “Healthy University” movement that emerged from this [63, 64]. The literature recognises that universities are environments in which a wide range of health and wellbeing initiatives are delivered; the “Healthy University” movement recognises this and focuses upon connecting potentially disparate strategies and mapping and connecting a diverse range of stakeholders within and beyond an organisation to address health and wellbeing. It is also worthy of note that the “Healthy University” movement, and the “Whole University Approach” [65, 66] associated with them not only highlight the importance of connected services within the organisation, but also across the wider community in which the university is situated—a finding that is highly congruent with the fundamental ethos of social prescribing [67].

The challenges faced by universities in terms of engaging students with services has emerged repeatedly within this review, particularly the sense of stigma experienced by those who may be accessing services, and the data highlights the enabling impact of a *Healthy Setting* upon this [68]. One must of course recognise that although key universal principles may be inducted from the literature, the profile of the organisation and its constituent community must

also be carefully considered [63]. Thus, this final theme indicates that a social prescribing pathway will function most effectively when situated within a wider organisational culture that is settings-based and actively champions mental health and wellbeing. Services must be co-ordinated (both within the organisation and across the wider community in which the university is situated), and interventions and approaches must be responsive to the needs of the specific student population.

The Refined Programme Theory

The diagram presented within **Figure 2** brings the themes discussed together into a Realist Programme Theory of social prescribing in HE. The student enters the system through an *Accessible Gateway* that may be physical or digital, and it is here that the individual providing the social prescription is initially encountered. The literature is replete with terms to classify both the scope and nature of this complex and multifaceted function [11, 54], but within this review the term “Navigator” is used. This *Skilled Peer* facilitates the social prescription through the “What Matters” conversation and/or signposts the student to a repository of *Trusted-Safe-Credible Resources*. These may include university services, curated information, assets located within the wider community, or a combination of these. Finally, the theory indicates that the social prescribing pathway sits within a wider *Healthy Setting* context that embodies a core ethos of accessibility, inclusivity, support, and empowerment for all members of the university community.

DISCUSSION

We sought to develop a Realist Programme Theory articulating the implementation of a social prescribing pathway within a HE environment. Whilst a range of isolated interventions that may be broadly captured as containing elements of a social prescription surfaced within the literature examined, e.g., an intergenerational arts project involving students and older adults from a local community [60], an online platform that allowed students to crowdsource wellbeing advice [46], we were unable to identify any bespoke pathways for university students. The review therefore represents a novel synthesis and application of the approach. Returning to the Refined Programme Theory (**Figure 2**), key findings may be drawn from the four themes within the review—relating to the pathway entry point, qualities of the social prescription “provider,” nature and scope of the resources that are available, and broader institutional context within which the pathway is situated. The key findings may be summarised.

The Gateway

This is the first point of contact with the social prescribing pathway, and accessibility was a fundamental consideration. The review data indicate that there is a very strong preference for online access to wellbeing support which should be available at any time and from any location. As large and complex organisations, universities are comprised of many departments offering a range of services; the review acknowledges this,

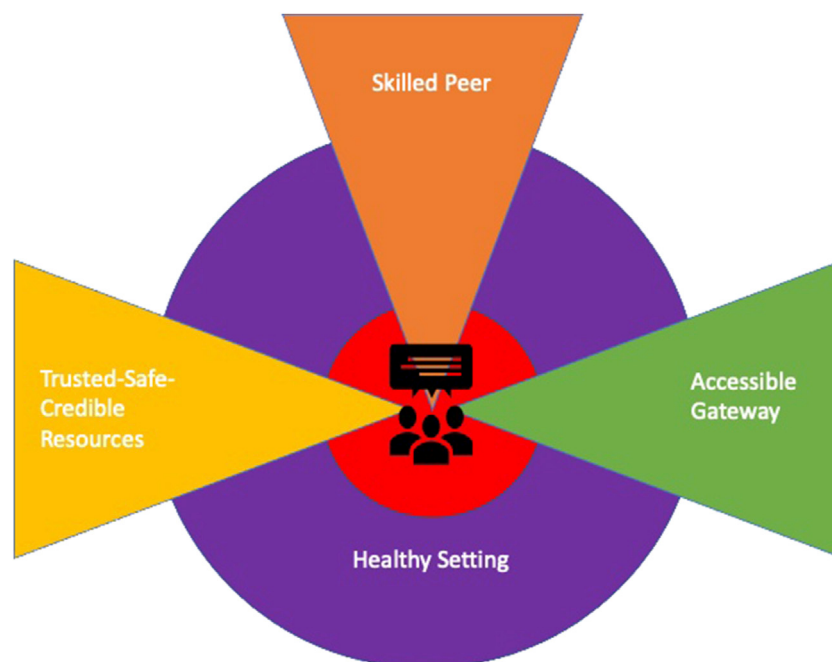


FIGURE 2 | The refined programme theory (University of South Wales, United Kingdom. 2022).

recommending that the social prescribing gateway be linked as seamlessly as possible with existing services—if a bespoke social prescribing IT solution is employed, this should be able to interface with existing systems. For the corresponding physical gateway, attention should be paid to the location. The literature highlights the stigma associated with accessing support for mental health and wellbeing [47, 49–51], and locating a physical hub within a “student owned” space such as a library or café will significantly ameliorate this issue.

The Social Prescriber

The individual instigating a “What Matters” conversation and facilitating the subsequent social prescription is a pivotal component of the pathway. Several of the projects interrogated within the review involved mental health and wellbeing support provided by other students. However, the literature also recognises both the overall complexity and psychological challenges associated with the social prescriber role, and using volunteers in this way would be neither efficacious for the student or nascent social prescriber. Other ways in which peer support can be leveraged may therefore need to be considered when implementing social prescribing pathways, e.g., through peer-led wellness activities [57], or in some form of signposting or advisory capacity [12]. In considering the skills set of the social prescriber, the importance of a knowledgeable individual and well-developed interpersonal skills was evident [61]. However, one must also be cognisant that a social prescribing service requires the nurturing of community assets that exist beyond the university, and if “buy in” is to be achieved from these assets, then the prescriber will also need to cultivate significant Relational Social Capital [69–71], lest the pathway be no more than a signposting system [12] to services within the institution.

The Resources

The third component of the model relates to the trusted and credible resources to which a user of the pathway is referred. The resources made available to the student may consist of services within the university (e.g., finance, counselling, student-run groups), local community assets (e.g., theatre groups, craft groups), digital resources (e.g., apps, online wellness platforms), or any combination of these. Asset mapping is a key process here; the social prescriber identifies potential support systems from within or beyond the university. The online space is also replete with support systems of variable quality, and the review indicates that attempting to discern what may be of genuine value can also be problematic when one is seeking support. For this reason, the review indicates curation of online resources to which those with lower levels of need may be signposted. Providing students with an opportunity to source, curate, and rate both physical and online assets can increase the sense of trust and authenticity for those using the services [46].

The Wider Institutional Setting

The social prescribing pathway here sits within a wider institutional setting. The review data indicates that for a pathway to become more than a “pet” project or series of disparate interventions, the overarching institution must

embody a clear commitment to physical and psychological wellbeing, as well as recognising its position as part of the wider community. Adopting such an approach may be challenging for some HEIs, but there is now a ground shift where the importance of a settings-based approach to physical and psychological wellbeing is recognised [63, 67,68].

Revisiting the Review Questions

What Forms of Social Prescribing Interventions are Specifically Targeted at HE Students?

No specific social prescribing pathways directly targeting HE students were surfaced within this Realist Review. Several isolated interventions that contained elements of a social prescription were however identified, and these were drawn upon in terms of developing CMO configurations. The quality of any resources made available to students through social prescribing (*Trusted-Safe-Credible Resources*) features strongly within the review and has become an integral component of the Programme Theory.

How do HE Students Access Social Prescribing Interventions Targeting Them?

The need for an *Accessible Gateway* that spans the physical and virtual environments is pivotal here. Likewise, if one is to effectively gain access to social prescribing and its associated assets, the individual functioning in a social prescriber capacity must be a *Skilled Facilitator* who adopts a holistic approach; cultivating a meaningful relationship through a “what matters” conversation to co-produce a student-centred solution.

When do HE Students Access Social Prescribing Interventions?

The review data indicated that flexibility is paramount; this being particularly well served by the provision of both physical and virtual gateways.

For whom do Social Prescribing Interventions Work?

The interventions that were drawn upon to build the CMOs and associated Programme Theory spanned a broad range of groups. It is therefore not possible at this stage to discern with any confidence for whom social prescribing interventions work.

To what Extent Does Social Prescribing Work for HE Students?

The extent to which social prescribing works for UK HE students was not discernible from the review data. The Realist Programme Theory here was subsequently tested with participants, and the findings will be reported within a future publication.

Strengths and Limitations

This Rapid Realist Review explores the application of social prescribing within HE. This is a nascent area, and the data indicate the principles of social prescribing may impact positively upon student wellbeing, whilst also facilitating closer working relationships between universities and the wider communities within which they are situated. However, given the limited use of social prescribing approaches within HE, the

range of literature and associated CMOCs was sparse, and there was a requirement to draw significant upon demi-regularities [33, 34] i.e., analogous processes functioning within other student wellbeing interventions. Whilst the direct generalisability of findings is confined to the UK Higher Education environment, it is anticipated that the underpinning principles can support the development of practice within the global arena.

Conclusion

Contemporary literature suggests that supporting student with psychological wellbeing is an ongoing challenge; the review undertaken here indicates that leveraging the principles of social prescribing may be one strategy that could be used to ameliorate this. The review has resulted in the induction of a Realist Programme Theory of *causation* and *implementation*; articulating a pathway that functions specifically within the UK HE content. The underpinning principles may however be useful in the development of cognate approaches at a global scale.

AUTHOR CONTRIBUTIONS

MD prepared the initial protocol, developed the search strategy, facilitated the advisory group, undertook the main searches and document screening at title, abstract and full-text level, carried out the coding and development of CMOCs and refined programme theory and prepared the final manuscript. ME supported development of CMOCs and the refined programme theory, contributed to the interpretation of findings and revised the final

report. ME reviewed and commented on the manuscript. SW contributed to the formal search strategies, carried out consistency checks on documents in screening and provided practice expertise and perspective. SW reviewed and commented on the manuscript. CW contributed to the development of the protocol and search strategy, carried out consistency checks on document screening and coding, developed and refined the programme theory and CMOCs and revised the final report. CW reviewed and commented on the manuscript. All authors contributed to the article and approved the submitted version.

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CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

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Building Pathways Into Governmental Public Health Careers Through Academic-Governmental Public Health Partnerships

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INTRODUCTION

Governmental public health in the state of Minnesota (in the United States), as in many other U.S. states, needs to increase its workforce, given its depletion leading up to, and following, the COVID-19 pandemic [1]. To address this, the Minnesota Department of Health (MDH) and the University of Minnesota School of Public Health (UMN SPH) formed a partnership to develop a program to broaden the pathways to careers in governmental public health for undergraduate, graduate, and Master of Public Health (MPH) students.

Minnesota, located in the north central U.S., population approximately 5.7 million, is roughly the size of the United Kingdom. In the U.S., states are primarily responsible for protecting the public health of their residents. The Minnesota public health structure consists of a partnership between MDH, 11 sovereign tribal nation health departments, which serve American Indian communities, and over 50 community health boards. MDH and UMN SPH are located in the major urban center of Minnesota, while many of the local and tribal public health agencies are located in rural regions. Among the challenges that Minnesota public health agencies face are recruiting and retaining staff, and maintaining readiness for response to emergencies, including those caused by human action, natural disasters, and infectious diseases.

MDH received a federal grant from the Centers for Disease Control and Prevention, which focuses on COVID-19 crisis workforce development and emergency preparedness and response (EPR). This grant funded and guided the development of our three-pillared program (**Figure 1**). MDH and UMN SPH program partners share governance of the program; decisions are made through discussion and group consensus. The program partners also consult regularly with an advisory group of local, tribal, and state public health professionals. This academic-governmental public health partnership offers an approach to rebuild the essential governmental public health workforce.

PILLAR ONE: SEMINAR SERIES

Starting with undergraduates, we wanted to inspire students and encourage them to consider careers in governmental public health and EPR. To reach undergraduates, we embedded a seminar series called “Stories from the Field” into an undergraduate *Introduction to*

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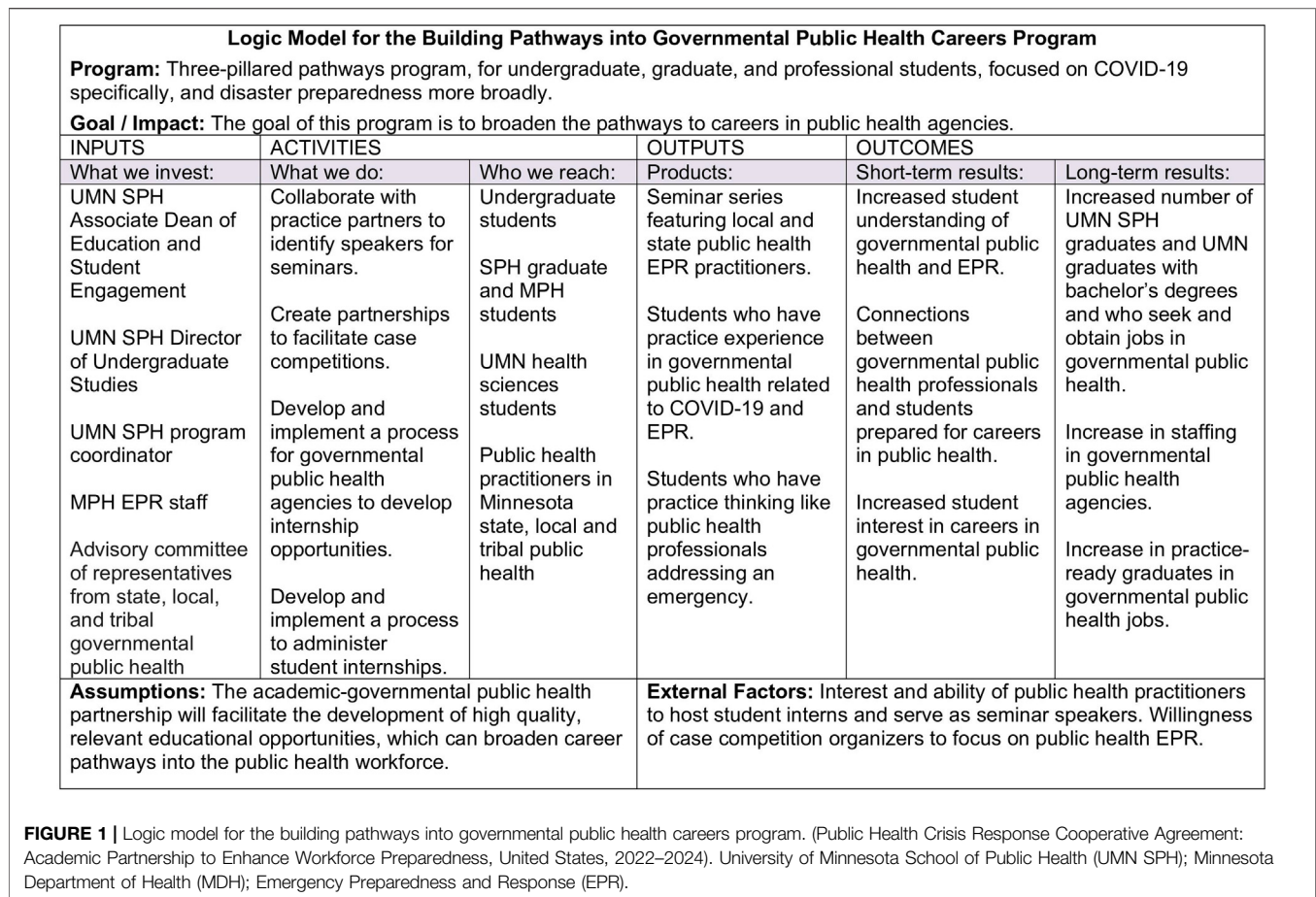
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Epidemiology course. During each seminar, local and state public health EPR practitioners share their education and pathways into their current careers, how their jobs were shaped by the COVID-19 pandemic, and why they enjoy working in this field. Bringing current professionals into the classroom helps students learn about real-life scenarios and experiences, and network with potential future employers and colleagues.

Understanding that many public health professionals have numerous commitments, we work closely with our MDH colleagues and our advisory group to conduct targeted outreach and speaker recruitment. We also accommodate practitioners' needs, including providing the option of presenting over Zoom. The seminars start with a personalized video welcome from a prominent public health practitioner with EPR experience. Each seminar features two or three guest speakers from public health agencies across Minnesota. Initially, we observed that most students lacked the foundational knowledge of governmental public health and EPR to fully absorb the speakers' content. To address this, we now begin each semester with a seminar by an MDH expert who provides an overview of EPR.

PILLAR TWO: INTERNSHIP PROGRAM

We launched a paid internship program to both help with COVID-19 response and recovery work, and to provide experiential learning opportunities for undergraduate and UMN SPH graduate and MPH students. First, we consulted with our advisory group to understand the needs of the public health agencies and to identify barriers to participation. The top barriers included identifying projects, supervising students, and managing administration. To address these barriers, MDH staff worked with their colleagues to brainstorm ideas and explore creative methods for managing projects. In addition, UMN SPH conducted the administrative work of recruitment, hiring, and payroll of student interns, offered help with project development, and frequently checked in to identify and resolve any supervisor-intern issues.

Up to now, interns have worked on several projects, including COVID-19 storytelling, journal article writing, qualitative data analysis, inventory management, community engagement, and emergency plan revision. Surveys indicate that the overwhelming majority of supervisors would recommend the internship program to their public health colleagues, and would consider hosting another student intern. Likewise, surveys indicate that the

majority of interns felt that their experience was meaningful; that they were highly satisfied with the support provided by their supervisor and UMN SPH; that the experiences improved their understanding of governmental public health, EPR, and COVID-19 response and recovery; and that the experience increased their interest in EPR as a potential career. There were clearly mutual benefits of the internship program: many of the internships were extended, and some students were offered positions from their internship host site.

The internship program revealed a need to develop alternative approaches for pathways into careers in local and tribal public health agencies located in rural areas. In addition to lacking the capacity to supervise students, rural agency staff were reluctant to propose a project because they were concerned that students from an urban university would not be willing or able to work on site, and because personal community connection is important. One future strategy would be to develop internship programs with colleges located closer to the rural public health agencies.

PILLAR THREE: CASE COMPETITIONS

Another strategy we used to build interest around governmental public health EPR careers was to offer case competitions in which interdisciplinary teams of health sciences students develop response strategies to a disaster. We partnered with university organizations who have existing case competition programs. The cases are written by a team that includes members from UMN SPH and MDH. They are developed with the following aims: Introduce a large number of undergraduate and graduate students to a community health challenge faced by Minnesotans, which governmental public health agencies need to address; Provide mentorship to students by public health professionals; Create an opportunity for students to think critically about how to solve community health needs related to COVID-19 and EPR. This activity allows students to start thinking like public health professionals by asking them to provide recommendations and propose actions to address the emergency.

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Partnering with existing case competition programs increased the reach to students from a variety of academic disciplines. This improved the quality of the experience by bringing together a variety of perspectives and expertise. Surveys indicated that participants found that the competition was a valuable learning experience that increased their interest in a career in public health EPR.

CONCLUSION

Grant funding helped us establish the infrastructure needed to launch and sustain this program. The seminar series and case competitions, which have minimal costs, will continue, although the focus of future cases may change. UMN SPH MPH students are required to complete an internship. Although the grant funding for internships will end, students often complete unpaid internships because they value the experience and professional connections. The processes we developed, and the positive experiences of intern supervisors, will help grow the internship opportunities in governmental public health. The short-term outcomes of this program are promising. Surveys indicate that the students gained knowledge of, and interest in careers in, governmental public health through the seminar series, internships, and case competitions. Finally, we plan to track the interns to determine if, in the long run, they apply for and obtain employment in governmental public health.

AUTHOR CONTRIBUTIONS

KM, RN, DR, and MS contributed to all three parts of the project. IR primarily contributed to the case competitions. EW primarily contributed to the internship program. All authors contributed to the article and approved the submitted version.

CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

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Importance of Community Health Workers for Maternal Health Care Management

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Objectives: Community Health Workers (CHWs) are important healthcare professionals and key members of team. The purpose of this research is to identify the roles and responsibilities of CHWs in developed and developing countries who provide healthcare assistance to pregnant and lactating women.

Methods: For this particular study, a comparison was conducted between CHWs role in seven developed countries, seven South Asian developing countries, and India, with special emphasis on improving maternal health status.

Results: CHW programs are essential in communities, institutional health programs, and outreach delivery systems. Without active community involvement, CHWs cannot reach their full potential. Developed countries have frameworks for CHWs, such as the Swasthya Shebika Program, Village Health Worker Cadret, Lady Health Worker Programme, and Accredited Social Health Activist program. CHWs are well-paid in developed nations and work with marginalized groups to spread health messages. However, up to 60% of community health workers in low- and lower-middle-income countries do not receive remuneration.

Conclusion: Health systems must support CHWs in choosing technical interventions and providing necessary training, supervision, and logistical support.

Keywords: Anganwadi workers, ASHA workers, community health workers, lactating mothers, pregnant women

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INTRODUCTION

"Communities" are groups of people who may or may not live close to one another but who still hold the same beliefs, concerns, or identities as per WHO. These groups may be local, national, or international and may have narrow or broad interests. The term "community health worker" (CHW) refers to social service and/or public health professionals who work effectively with and for the community, promoting healthy lifestyles. They might provide paid or unpaid volunteer work for a nearby business, institution, or hospital. Similarities in race, language, culture, financial background, values, and life experiences exist between CHWs and the community individuals they serve. According to the US Department of Labour, CHWs are those who "help individuals and communities adopt healthy behaviors" and "conduct outreach" in addition to "advocating for people's individual and community health needs" [1].

Health of women during pregnancy, childbirth, and the postpartum period is referred to as maternal health. Every stage should be healthy in order to help women and children achieve their greatest potential for wellbeing. A shocking 287,000 women died during and after pregnancy and delivery in 2020, despite tremendous progress over the previous two decades [2].

The Millennium Development Goals (MDGs), which were completed in 2015, were replaced with the Sustainable Development Goals (SDGs), which are intended to be accomplished by 2030 [3]. The SDG states that by 2030, the neonatal mortality rate should be as low as 12 per 1,000 live births and the MMR (maternal mortality ratio) should be reduced by 70 per 100,000 live births. The provision of primary healthcare is hampered by insufficient government spending, a shortage and unequal distribution of the health workforce, and inadequate multi sectoral training [4]. At this time, WHO started to place a fresh emphasis on primary healthcare (PHC) and driven Universal Health Coverage (UHC) as a means of achieving the SDGs related to health.

The National Health Mission (NHM) [5] has two sub-missions: the National Rural Health Mission (NRHM) and the National Urban Health Mission (NUHM). The three main elements of the programme are Communicable and Non-Communicable Diseases, Reproductive, Maternal, Neonatal, Child, and Adolescent Health (RMNCH+A), and. Everyone will have access to fair, affordable, and high-quality healthcare services that are responsible and considerate of the needs of their patients, in accordance to the NHM. UNICEF works with the Ministry of Health and Family Welfare (MoHFW), the Ministry of Women and Child Development (MWCD), NITI Aayog, and state governments to support planning, budgeting, policy creation, capacity building, monitoring, and demand generation. It supports the abilities of health administrators and supervisors at the district and block levels when planning, implementing, monitoring, and supervising efficient maternal healthcare services with a focus on high-risk pregnant women and those in hard-to-reach, vulnerable, and socially disadvantaged communities. Reaching every mother, providing continuum of care, and providing antenatal care are among the measures by the Indian government that UNICEF is supporting.

UNICEF supports the implementation of the MoHFW's policy, which stipulates that every delivery should be attended by a qualified healthcare professional at a hospital in order to enhance the health and nutrition of pregnant mothers and provide high-quality maternal health services. To guarantee a healthy pregnancy and rapidly identify high-risk conditions that could harm their health or the health of their growing foetus, all expectant mothers must register for antenatal treatment at the local healthcare institution promptly as they become aware of their pregnancy.

To achieve the global goal of improving maternal health and saving women's lives, we need to accomplish more to reach those who are most at risk, such as women in rural areas, urban slums, households with fewer resources, adolescent mothers, women from minorities and tribal, Scheduled Caste, and Scheduled Tribe groups.

The significance of study is multiple folded. Firstly, it will enable in exploring the problems faced by health workers and beneficiaries in implementing maternal healthcare schemes or programme generated by government. This also enables in knowing nations perspectives regarding maternal healthcare. Understanding more about the precise role, responsibilities, and contributions of these CHWs in enhancing the health status of the community. This will also be helpful to the larger community, government, policymakers, health planners, national

programme, researchers, programme managers, and the public health system of India. Recognizing the promoters and obstacles that arise in meeting the community's fundamental health needs can also be helpful in future efforts to advance their work and social standing and consequently build a healthy nation.

METHODS

The present study "Importance of Community Health Workers for Maternal Health Care Management" is undertaken with the objective to understand nations perspectives regarding maternal healthcare. Also, to review the roles and responsibilities of community health workers and recognize the obstacles arising while reaching community health needs.

Maternal mortality rate is much higher in developing countries than in developed countries as presented in **Figures 1A, B**. For this reason, the methodology accepted for the particular study includes CHWs and their roles in seven developed countries and seven south Asian developing countries were compared in addition with Indian studies on contributing roles of community health workers in improving maternal health status.

All nations are divided into three groups based on their economics, according to the World Economic Situation and Prospects (WESP) classifications (2022): established economies, economies in transition, and emerging economies. Seven significant developed nations and South Asian developing nations were chosen for the current study.

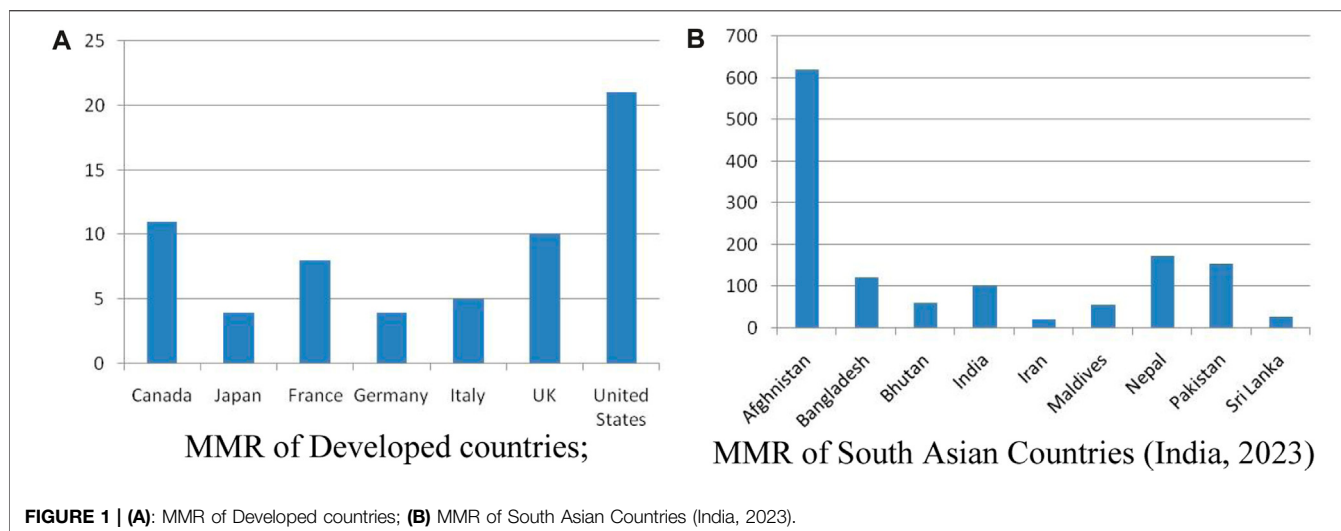
Iran being a South Asian developing country was not purposely selected because its MMR is 22 per 100,000 live births. With a maternal mortality rate (MMR) reduction of 75% by 2015, Iran is one of the nations that has succeeded in fulfilling MDG5, having attained the largest reduction among its neighbors, with the exception of Turkey. Iran's MMR was 274 in 1975, dropped to 150 in 1990, continued to decline, and reached 94 in 1995, 38 in 2005, 30 in 2008, and 25 in 2015, a number comparable to developed countries [6, 7].

A review of the many advancements made by the community health workers (CHWs) in basic healthcare is presented in this paper. This can be used as a valuable resource for learning about the work carried out by CHWs to ensure high-quality healthcare delivered to the target population by reviewing it. This literature review was conducted with the assistance of databases like PubMed, Google, and Google Scholar in order to gather a comprehensive amount of information. As part of this study, we investigated how CHWs are able to efficiently deliver vital healthcare services to the community.

RESULTS

In this section, **Figures 1A, B** show the maternal mortality ratio (modelled estimate, per 100,000 live births) as reported by WHO [2], UNICEF, UNFPA, the World Bank Group [8], and UNDESA/Population Division.

From the data presented in **Figure 1** this is revealed that Iran being an developing country has MMR equivalent to developed



countries. The 1920s saw the establishment of a sizable CHW programme in Ding Xian, China. At that time, Jimmy Yen, a Chinese community development specialist with experience teaching adult literacy, and Dr. John B. Grant, a Rockefeller Foundation employee assigned to Peking Medical University, trained illiterate farmers to keep birth and death records, administer smallpox and other disease vaccinations, give first aid and health education talks, and assist communities in keeping their wells clean [9].

The CHW projects in South Asia have a long history of being active, and the CHWs there still play a significant part in primary healthcare and serve as links between the community and the healthcare system. Countries in the region are simultaneously experiencing demographic and epidemiological changes, with populations that are getting older, more urbanized, and suffering from a greater burden of non-communicable diseases. In such a situation, it is vital to increase the contribution of CHW initiatives to PHC strengthening and fulfilling the region's objectives and aspirations.

Roles and Responsibilities of CHW

In this section, roles and responsibilities of Community health workers is discussed with special emphasis on their implementation in the community, training, salary and impact on the society. Seven major developed countries - Canada, Japan, France, Germany, Italy, United Kingdom and United States were selected to review the roles and responsibilities of CHWs in developed countries. The roles, responsibilities and implementation of CHWs in respective countries is presented in **Table 1**.

This can be summed from **Table 1**, that CHW in developed countries are provided with a framework to discuss their knowledge, challenges, resources and implementations to be applied to create a sustainable growth in terms of maternal health, child care and elderly support. Midwives along with other professionals are implemented to focus on pregnant and lactating women.

CHW are implemented by NHS (National Health Services) with the aim to reduce complications associated with pregnant

and lactating women. Health professionals are organized under Ministry of health and run as universal public healthcare system.

In addition to professional education additional training of varied duration 3 months, 6 months or 1 year is provided to increase on job training experience. Various awareness programme are launched to increase knowledge regarding challenges faced by vulnerable group of people (pregnant mothers, lactating women, infants and elderly people). France offers comprehensive training for health careers, covering 5 years, including midwifery education in 35 schools across Europe.

Major role of CHW is shifted towards providing education, awareness and counselling regarding various health issues and non-communicable diseases to community members. HIV prevention, maternal-child and nutritional health promotion, oral health promotion for preschoolers, and facilitating marginalized communities' access to health services. Despite the fact that childbirths in Germany take place in hospitals, midwives are required to be present at every birth and can also provide services in women's homes.

CHWs reach out to marginalized populations with targeted programme and important health messages and are well-paid with good benefits. The expense of this care is covered by both statutory and private health insurance providers [10]. CHW are paid by the management of organization depending on the sector whether public or private sector. Additional incentives and benefits are also provided.

Majority of CHWs are supervised by Ministry of Health. Various awareness and training programmes are implemented under the supervision of organizations to enhance the impact of CHW on beneficiaries. CHWs improve health outcomes by reaching marginalized communities, reducing health inequalities, and promoting quality care for women and newborns. They also reduce diabetes and hypertension risks through integrated care and awareness programs.

The background information, roles and responsibilities of CHWs in seven Sub Asian developing countries—Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, Sri Lanka is presented in **Table 2**.

TABLE 1 | Roles and responsibilities of CHWs in major developed countries (India, 2023).

S.No	Country	Background	Implementation	Training	Roles and responsibilities	Incentives	Supervision	Impact
1	Canada [11]	The CHW Network of Canada offers a space where CHWs and their allies can exchange information, skills, and resources. CHWs are rooted in the communities they serve and go by various names	CHWs are employed in a variety of settings, such as public health departments, community health facilities, organisations with a focus on certain ethnic groups and cultures	Organisational training programmes, institutional training programmes, and on-the-job training are the three types of education and training	HIV prevention, maternal-child and nutritional health promotion, oral health promotion for preschoolers, and facilitating marginalised communities' access to health services	In Canada, a community health worker makes \$51,097 years, or \$26.20 per hour	CHWs work under different divisions—Hamilton's Ontario Public Health division, Multicultural Health Team, Ottawa Public Health and the Toronto Public Health Unit	CHWs reach out to marginalised populations with targeted programmes and important health messages and are well-paid with good benefits
2.	Japan [12, 13]	Health promotion volunteers in Japan focus on supporting the elderly and educating future generations about disease prevention	CHW intervention in Japan has changed over time to focus on preventing chronic diseases associated with aging and staving off frailty among the elderly	CHWs are trained by municipality generally for lasts between 1 and 6 months of duration for providing awareness among community people regarding healthy diet, maternal and child health and proper development	Major role of HW is shifted towards providing education, awareness and counselling regarding various health issues and non-communicable diseases to community members	Generally are unpaid volunteers	Supervised by municipality	CHWs contributes to increasing the number of healthy years lived and decreasing health inequalities
3.	France [14, 15]	Midwives are the health professionals who work to improve maternal health status	Midwives along with other professionals are implemented to focus on pregnant and lactating women	France offers comprehensive training for health careers, covering 5 years, including midwifery education in 35 schools across Europe	Midwives maintain surveillance on women during pregnancy and childbirth, and they help new mothers by offering postnatal care	They work in private or public sector; and some are also self employed	Supervised by European midwifery associations	Improves quality care for all women and newborn infants
4.	Germany [16]	The public and private sectors both use midwives' services	Despite the fact that childbirths in Germany take place in hospitals, midwives are required to be present at every birth and can also provide services in women's homes	Either a 4-year degree from universities of applied sciences or a 3-year basic vocational education	Midwives are assigned role of providing assistance during pregnancy, birth and postpartum duration	Depending on number of hours, they are paid by management of organization	Supervised by federal and state laws which support and secure their practice	Majority of pregnant women received essential integrated cares and schemes awareness
5.	Italy	Healthcare workers and midwives provide support to pregnant	Health professionals are organized under Ministry of Health and run as a	Training lasts 3 years including internship periods in healthcare facilities	Health professionals are crucial in providing family planning advice and reducing	Healthcare workers earn minimum of 1,191 to 3,383 EUR per month	Supervised by Ministry of Health	Significant improvement in the health of pregnant women and child health

(Continued on following page)

TABLE 1 | (Continued) Roles and responsibilities of CHWs in major developed countries (India, 2023).

S.No	Country	Background	Implementation	Training	Roles and responsibilities	Incentives	Supervision	Impact
		women during motherhood, delivery and childcare	universal public healthcare system		illness transmission from mother to child. Health professionals are crucial in providing family planning advice and reducing illness transmission from mother to child			
6.	United Kingdom [17]	Healthcare work professionals provide parenting classes, clinical examinations and screening	Health professionals are implemented by NHS (National Health Service), England	Broad structured curriculum with a low level of technical proficiency	Health promotion for behavioral changes, including quitting smoking, encouraging breastfeeding, maintaining good sexual health, and engaging in physical activity	In the United Kingdom, a healthcare professional makes an average annual pay of £22,078	Many courses and training programs are available to enable them to provide good maternal health support	Health professionals improves the perinatal and postpartum outcomes
7.	United States [18, 19]	CHWs reach formerly to under served individuals that often have complicated medical and social requirements	CHWs were implemented in US with aim to reduce life threatening complications in pregnant women	Currently, 30 authorities provide CHWs with some kind of standardized training	Home visits, health-promoting initiatives, and the prevention of ailments like TB and HIV	CHWs receive a set monthly salary of SLL 150,000 (\$17.5), while supervisors are compensated with SLL 250,000 (\$29.2)	CHW supervisor plays a crucial role in providing counselling and support to CHWs	Risks of diabetes and hypertension was reduced on intervention of CHWs

CHWs are essential components of the Basic Package of Health Services (BPHS) community-based healthcare (CBHC) section. Bangladesh has a history of using CHWs to support health services, with BRAC's Swasthya Shebika (SS) Program focusing on female health workers. Bhutan has a Village Health Worker (VHW) cadre, while Family Health Worker (FHW) and Community Health Worker (CHW) cadres work together. The Lady Health Worker Programme (LHWP) was established in 1994 to provide primary care services to underserved populations. In Sri Lanka, community health workers have two key frameworks: Public Health Midwife (PHM) and Public Health Inspector (PHI).

Health centres, including health centres, employ a District Health Management Team (DHMT) and NGOs to implement BPHS. The MoH is responsible for policy formulation and implementation, while NGOs provide health services and support local needs. Family Health Workers (FHWs) are associated with health centres, providing outreach and house visits. In Pakistan, LHWs provide emergency care at their homes, with priority given to reproductive couples and children under five. Sri Lanka's midwife curriculum is based on WHO and ICM competency frameworks, covering family planning, nutrition

education, antenatal care, and psychosocial and reproductive needs of young widows.

CHWs receive a month of field experience, while SSs receive 4 weeks of basic training, VHA receives interpersonal communication training, and receive 3 days of refresher training annually. FCHVs receive 18 days of initial training, followed by 5-day refresher training every 5 years. LHWs receive 1 year of on-the-job training, including 1 week of refresher training each year. The 18-month training period remains unchanged since PHM abolition 93 years ago.

CHWs offer health promotion, referral, and referral services, including community case management, TB treatment, and family planning. They educate families on nutrition, safe delivery, immunizations, hygiene, and water and sanitation. CHWs implement up to fifteen national public health programs, including nutrition, NCD screening, communicable disease prevention, reproductive health, family planning, and vector surveillance. They provide reproductive services, family-oriented services, and basic health education. LHWs visit 27 households weekly, promoting antenatal care, immunization, vaccination, breastfeeding, and maternal health. A nutrition programme that includes growth monitoring and

TABLE 2 | Roles and responsibilities of CHWs in Sub Asian Developing countries (India, 2023).

S.No	Country	Background	Implementation	Training	Roles and responsibilities	Incentives	Supervision	Impact
1.	Afghanistan	The community-based healthcare (CBHC) a portion of the Basic Package of Health Services (BPHS) includes the Community Health Workers (CHW) project	In order to execute BPHS, CHWs are stationed at health posts as male and female teams, working in pairs	CHWs receive a month of field experience in their villages between three separate 3-week modules	CHWs provide a comprehensive set of services from health promotion to referral to the next level of care, including community case management, TB treatment, and family planning commodities	CHW are volunteers	Community Health Supervisors (CHSs) visit health posts and CHWs meet monthly to discuss health issues	CHWs are an important contributor to Afghanistan's improved health status in the past decade.
2.	Bangladesh [20–24]	In order to address socio-cultural barriers, Bangladesh has a history of deploying CHWs to support health services, with BRAC's Swasthya Shebika Programme concentrating on female health workers	The number of SSs has grown significantly since 1990 from 70,000 to more than 100,000	BRAC provides basic training to SSs for 4 weeks on how to manage illnesses, encourage healthy habits, and refer patients to services	In addition to educating families on nutrition, safe childbirth, FP, immunisations, cleanliness, and water and sanitation, SSs offer health promotion programmes. In order to give Community Health Volunteers CHVs an additional incentive in addition to the sales component, BRAC created it	To create revolving money and market health items with a minimal markup, CHVs use modest loans	Swasthya Kormis (SKs) provide direct supervision to CHW	The programme in Bangladesh has significantly lowered under-5 mortality and improved TB control on a countrywide level
3.	Bhutan [25]	The CHW cadre in Bhutan is the Village Health Worker (VHW), who provide primary healthcare in the country. VHWs are responsible for providing first aid and treatment for minor ailments, creating awareness, and mobilising the community for health promotion	The MoH is responsible for policy formulation and implementation, while the (District Health Management Team) DHMT is responsible for providing health services and responding to local needs. The (Non-Communicable Disease Division) NCDD is responsible for maintaining the VHW database. Health administration and management are devolved to districts and MOH provides technical support to local governments	VHA receive training on interpersonal communication by Health Assistant (HA) and DHO. 3 days refresher trainings are given annually	VHWs promote healthy practices and care seeking behaviours in the community, facilitating access to quality services	VHWs are voluntary cadres with no salary and limited monetary incentives for training and immunization campaigns	HAs in health facilities are responsible for training and supervising VHWs. Community members and the Gewog Yargay Gewog Tshogde (GYT) also monitor the VHWs' activities, but supervision is generally poor with no standard operating procedures or clear guidance	Gender imbalance in VHWs could affect the uptake of health services by women and adolescent females. To increase female participation, cultural, social and gender barriers must be addressed, as well as improving employment conditions
4.	Maldives [26]	The two different cadres of CHWs in the country are the Family Health Worker (FHW, or Family Health Officer), and the	CHWs provide a range of public health, preventative, and curative services, particularly those pertaining to reproductive health,	18 months advanced course in Primary Healthcare (PHC), 30 months course in diploma and	With the aid of CHWs, up to fifteen national public health programmes are put into action. A nutritional	The MoH employs CHW and FHW cadres as official salaried government employees who are completely	The provision of frequent oversight and monitoring was hampered by a number of problems,	The strategic orientations for coordinating primary and preventive healthcare, public health services, (Continued on following page)

TABLE 2 | (Continued) Roles and responsibilities of CHWs in Sub Asian Developing countries (India, 2023).

S.No	Country	Background	Implementation	Training	Roles and responsibilities	Incentives	Supervision	Impact
		Community Health Worker (CHW, or Community Health Officer). Assistant, CHO, and Senior CHO are the three different ranks of CHOs	out of the atoll hospital's Public Health Unit or an island-level health clinic. Formerly based in the community, Family Health Workers (FHWs) are now connected to the Health Centre but continue to conduct outreach and home visits	4years Bachelor's degree course	programme that incorporates growth monitoring, vaccination, NCD assessment, health education, communicable disease prevention and promotion activities, reproductive health and family planning, prevention and monitoring of diarrhea, and surveillance and control of vectors	integrated into the civil service system	including inadequate finance, a lack of technical and supervisory employees and staff turnover, as well as geographical obstacles. This has an effect on the provision of high-quality services and helps explain the inadequate adherence to and accountability for national standards	and the creation of a variety of care services, from promotion and prevention to treatment and rehabilitation, were discussed under the guidance of the MPHf
5.	Nepal [27–29]	VHWs, MCHWs, and FCHVs (Female CHVs) collaborate to assist each other's areas of responsibility and are based in neighbourhood health centres. While FCHVs provide logistical support for the distribution of vitamin A, VHWs organise communities for immunisation	Each health centre employs one professional health worker in addition to one VHW, one MCH Worker (MCHW), and normally nine (but possibly more) Female CHVs (FCHVs) to serve a region with a population of 5,000–10,000 people	FCHVs receive initial training for 18 days, followed by 5-day refresher training every 5 years	CHWs have defined scope of work, with MCHWs offering reproductive services, VHWs offering family-oriented services, and FCHVs providing basic services and health education	The government formally employs and compensates MCHWs and VHWs for their work. Non-financial incentives like a clothes allowance and community recognition are motivating elements for FCHVs	The FCHVs who operate in their geographic regions are supervised by VHWs and MCHWs. During monthly supervision visits, VHWs and MCHWs are in charge of replenishing the FCHVs and giving support, counsel, and feedback	In regard to low-income nations, Nepal has led the world in lowering its MMR, under-5 death rate, and fertility rate. There is broad consensus that Nepal's CHWs, especially the FCHVs, have contributed significantly to the accomplishment of the significant objectives—child and maternal health
6.	Pakistan [25, 27, 30]	In order to provide primary care services to underserved populations, the Lady Health Worker Programme (LHWP) was started in 1994. Improving service quality and broadening LHWP coverage were the two objectives outlined in the national strategic plan of 2003	In Pakistan, LHWs run so-called "Health Houses," which serve as emergency care and treatment facilities. They are in charge of about 1,000 people, with young children and couples in active reproduction receiving priority	LHWs undergo a year of on-the-job training, along with a week of refresher training every year, but training schedules vary by province	LHWs visit 27 houses each week and offer services like MCH, newborn care, TB community management, and HIV/AIDS health education	LHWs receive a salary of about \$343 per year. Because it frequently acts as the only source of income, the LHW stipend is an essential source of support for families	An LHW Supervisor (LHS) oversees each LHW each month. They are all connected to public health clinics. LHSs should visit with clients and LHWs for community-based supervision at least once a month. The LHSs should use this time to assess the LHWs' work and plan their own workday for the upcoming month.	For Pakistan's LHW Programme to provide adequate service coverage on a national scale for MCH SDGs, it must be improved and expanded

(Continued on following page)

TABLE 2 | (Continued) Roles and responsibilities of CHWs in Sub Asian Developing countries (India, 2023).

S.No	Country	Background	Implementation	Training	Roles and responsibilities	Incentives	Supervision	Impact
7.	Sri Lanka [31]	In Sri Lanka community health workers have two key frameworks that are currently active—Public Health Midwife (PHM) and Public Health Inspector (PHI)	The midwife curriculum in Sri Lanka is based on WHO and ICM competency frameworks, with content covering family planning, nutrition education, antenatal care, care of children with special needs, and psychosocial and reproductive needs of young widows	The 18-month training period has remained unchanged since the abolition of PHM was founded 93 years ago. A maximum of 3 years or a degree program was suggested to be adopted for PHM recommendation to provide “better care”	They have preventive, promotive and curative role. Promotes antenatal care, immunization, vaccination, breast feeding, maternal health, etc.	PHM and PHI compensation is aligned with government salary structures and in general salaries are paid on time. They also get accommodation, maintenance and allowances such as transport and communication subsidies	The monitoring and evaluation unit of MoH FHB monitors the implementation of the RMNCH to the program, including the operation of PHM	Sri Lanka achieved a high Human Development Index in 2019 and its health system has been recognized as successful, contributing to the attainment of the Millennium Development Goals

immunisation, NCD screening and health education, communicable disease prevention and promotion activities, reproductive health and family planning, prevention and surveillance for diarrhoea, and vector surveillance and control is regulated or coordinated by community health workers.

CHW and VHW are voluntary cadres with limited monetary incentives for training and immunization campaigns. The MoH employs CHW and VHW as official government employees, with government compensation and non-financial incentives. LHWs earn \$343 a year, with a stipend being crucial for family assistance. Compensation aligns with government salary structures, and they receive accommodation, maintenance, and allowances.

The MoH is responsible for policy formulation and implementation, while the (District Health Management Team) DHMT is responsible for providing health services and responding to local needs. Community Health Supervisors (CHSs) and Swasthya Kormis provide monthly supervision to health posts, while HAs train and supervise VHWs. However, poor supervision and monitoring due to insufficient funding, staff turnover, and geographical barriers hinder quality service provision and compliance with national guidelines. FCHVs are supervised by VHWs and MCHWs, while LHWs are affiliated with public health clinics and oversee them monthly. LHSs review work and create work schedules, while the MoH FHB monitors the implementation of RMNCH and PHM operations. Insufficient funding, shortages and turnover of technical and supervisory staff, and geographical barriers were some of the factors hampering the provision of regular supervision and monitoring [32].

CHWs have significantly contributed to Afghanistan's improved health status, reducing under-5 mortality and national TB control. Addressing gender imbalance in VHWs and improving employment conditions is crucial for female participation. Nepal has led the world in lowering maternal mortality, under-5 death rate, and fertility rates, while Pakistan needs to expand and strengthen its LHW Program for proper service coverage. Sri Lanka's health system has achieved high Human Development Index in 2019 and contributed to the attainment of the Millennium Development Goals.

The roles and responsibilities of CHWs in India is presented in **Table 3** with special emphasis on Auxiliary Nurse and Midwife (ANM), Accredited Social Health Activist (ASHA), Anganwadi workers (AWW).

In India the National Rural Health Mission (NRHM) was developed in 2000 to improve rural PHC, accountability, and community engagement in the public health sector. In 2005, the Accredited Social Health Activist (ASHA) program was launched with motivating and recognition initiatives. The ASHA Facilitator is responsible for developing health reports and consolidating information about pregnancies, births, deliveries, newborn care, and deaths. By cultivating a sizable pool of CHWs known as Accredited Social Health Activists (ASHAs), the Indian National Rural Health Mission (NRHM) 2005 sought to enhance health outcomes.

Family planning, bringing expectant women to hospitals for birth, mother and child health, and health education are among the tasks. They travel with a first aid pack. ASHAs are assigned 200 families, with a total population of roughly 1,000 people, to work in both urban and rural regions.

A 23-day training programme meant to provide ASHA workers with the required knowledge and abilities. ASHAs are honorary volunteers given honorarium and performance-based incentives. States can design their own incentives, with some introducing fixed monthly honorariums. Starting 2018, ASHAs will receive a minimum of Rs. 2,000/- per month for routine activities, along with other task-based incentives approved at Central/State level.

All three workers are supervised individually. The impact of ANM, ASHA and AWW is positive in nature. They promote better utilization of available schemes by the people. Also help in reducing MMR (Maternal Mortality Rate) and IMR (Infant Mortality Rate).

DISCUSSION

The evidence presented here indicates conclusively that CHW programs are not self-sustaining entities. Instead, they play a

TABLE 3 | Roles and responsibilities of CHWs in India (India, 2023).

S.No	Country	Background	Implementation	Training	Roles and responsibilities	Incentives	Supervision	Impact
1.	India [33–36]	India has three CHW cadres: ANM, AWW and ASHA. ANM provides care at subcenters, AWW works in villages and provides food supplements, and ASHA promotes MCH, including immunizations and deliveries	The ASHA program in India has been challenged due to the rigid hierarchical structure of the health system, despite its design to interact with the formal healthcare system and communities	AWWs and ASHA employees each receive 3–4 weeks of training, whereas ANMs receive 18 months with occasional additional trainings	ANMs are now MPWs with responsibilities to manage birth complications. AWWs manage nutritional supplementation and promote healthy behaviors, while ASHA workers focus on institutional deliveries, immunizations, provision of basic medicines, and referral of patients to the subcenter	ANMs are paid a government salary, while AWWs are volunteers paid an “honorarium.” ASHA workers also receive performance-based incentives for facilitating institutional deliveries and immunizations	All the three cadres of CHWs are supervised individually	Evaluations of CHW programs have produced mixed results, but efforts are being made to improve training, supervision, remuneration, and logistical support

significant role in a larger system of activities that includes communities, institutional health programs, and particular interventions that call for an outreach delivery system. Without the active involvement of communities as partners in collaboration and support, CHWs cannot reach their full potential. In order to choose the proper technical interventions for CHW programs and to give them the training, supervision, and logistical support that these interventions need, health systems must fully support them.

According to the 2006 World Health Report, countries that have fewer than 2.28 physicians, nurses, and midwives per 1,000 residents typically do not meet targeted 80% coverage for child immunization and competent birth attendance. The proportion of health professionals in the population and the survival of pregnant women and young children are directly correlated. Survival decreases proportionally when the number of health professionals decreases. The improvement of the nation's condition depends on the protection and promotion of women's health, that demands for a multisectoral plan of action. In developed countries, health services are provided with free comprehensive coverage to entire population irrespective of socioeconomic status in order to ensure equity in system.

The data show a noticeable rise in the number of health-related human resources, including midwives in Iran [37]. Approximately 33,208 midwives work in the Iranian health system [37] at various levels of management (Ministry of Health and Medical Education at the policy making and management level), education (training midwifery undergraduates, masters, and doctorates, and health workers), and as a member of the healthcare team and under the supervision of obstetricians or general practitioners in health centers [38, 39]. Midwives are the largest group of healthcare providers in health centres in Iran [40].

CHWs in developed countries are provided with a framework to discuss knowledge, challenges, resources, and implementations for sustainable growth in maternal health, child care, and elderly

support. They are essential components of the Basic Package of Health Services (BPHS) community-based healthcare section. Bangladesh, Bhutan, Sri Lanka, and India have established frameworks for CHWs, such as the Swasthya Shebika Program, Village Health Worker Cadret, Lady Health Worker Programme, and Accredited Social Health Activist (ASHA) program.

In developed countries CHW are implemented by National Health Service whereas in developed countries by Ministry of Health. Preventing unintended pregnancy is essential if maternal deaths are to be avoided. All women must have access to legal, safe abortion services as well as high-quality post-abortion care. As long as complications are managed or prevented, the majority of maternal deaths can be avoided. All women must have access to high-quality care during pregnancy, labor, and the postpartum period. The possibility that poor women in rural areas will receive adequate healthcare is the lowest [41]. According to the most recent data, 99% of newborns in high- and upper-middle-income nations benefit from the presence of a qualified midwife, doctor, or nurse. But just 68% of low-income countries and 78% of lower-middle-income countries receive such skilled assistance [42].

ASHA workers receive basic training, refresher training, and field experience in developing countries. They receive a 23-day program to provide knowledge and abilities. Community health workers, answerable to communities, represent the essential “missing link” between societal yearnings and communities in need. They receive interpersonal communication training, refresher training, and on-the-job training, with the 18-month training period unchanged since PHM abolition 93 years ago.

In developed nations, CHWs are well-paid with excellent benefits and work with marginalised groups to spread important health messages and specific programmes. Both public and commercial health insurance companies pay the cost of this care. Depending on the sector—public or private—CHW are paid by the administration of the organisation. There are also additional rewards and incentives

offered. However, alternative estimates—those looking at all community health workers rather than just those performing services on behalf of the government—show that in developing countries, up to 60% of community health workers in low- and lower-middle-income countries did not receive any remuneration. In India, ASHA workers rely mainly on the incentive they receive by registering pregnant women for JSY (Janani Suraksha Yojana).

The following are some factors that discourage women from seeking or receiving care during pregnancy and childbirth:

- Social determinants, such as income, access to education, race and ethnicity, that put some sub-populations at greater risk;
- harmful gender norms and/or inequalities that lead to discrimination; and health system failures that lead to 1) poor quality of care, including disrespect, mistreatment, and abuse, 2) insufficient numbers of adequately trained health

workers, 3) shortages of essential medical supplies, 4) the poor accountability of health systems.

Barriers to accessing high-quality maternal health treatments must be identified and removed at the health system and social levels in order to promote mother health in developing economy countries so as to achieve sustainable development goals.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

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Emerging Health Care Leaders: Lessons From a Novel Leadership and Community-Building Program

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Background: Although there are guidelines and ideas on how to improve public health education, translating innovative approaches into actual training programs remains challenging. In this article, we provide an overview of some initiatives that tried to put this into action in different parts of the world, and present the Emerging Health Care Leader (EHCL), a novel training program developed in Switzerland.

Policy Options and Recommendations: Looking at the experience of the EHCL, we propose policymakers and other interested stakeholders who wish to help reform public health education to support these initiatives not only through funding, but by valuing them through the integration of early career healthcare leaders in projects where their developing expertise can be practically applied.

Conclusion: By openly sharing the experiences, strengths, weaknesses, and lessons learned with the EHCL program, we aim to foster a transparent debate on how novel training programs in public health can be organised.

Keywords: public health education, public health leadership, transformative public health education, training program, transformative learning

BACKGROUND

The COVID-19 emergency highlighted the importance of a well-functioning public health workforce, which, in turn, requires well-designed training. Initiatives to enhance capacity building in this field already exist [1], but there is still a widespread concern that (postgraduate) training in the biomedical field is not fit for the new century [2]. In a recent contribution [3], Bürkin et al. proposed a framework how the educational approach for public health training should be changed. They recommended to break down disciplinary and professional silos, so that the public health community can come together and embrace a life-long-learning approach to education, where both academic and non-academic skills ("core human competences") are developed. The latter are particularly important, as literature shows that organisational, managerial and leadership skills are crucial for the public health workforce of the future [4, 5].

Abbreviations: SNSF, Swiss National Science Foundation; NRP, National Research Program.

However, translating proposals into practice requires directed efforts, since educational systems worldwide are constructed around traditional paradigms, which are not always easy to change. This is also due to the fact that innovative educational interventions are difficult to evaluate regarding their long-term impact. Therefore, reforming public health education requires also considerable courage from institutions, as they may have to commit time and resources for exploring new and uncharted territories regarding how training can be changed. It is thus key to share experiences on alternative and innovative setups of public health training, so that knowledge can circulate and (educational) institutions willing to reform their training can learn from the attempts others made in the field.

In this article, we contribute to this objective by reflecting on the Emerging Health Care Leaders project (EHCL), an innovative educational program for postgraduate early-career scientists in health service and public health research in Switzerland. First, we briefly summarise what some other comparable programs achieved in other parts of the world and then focus more specifically on the EHCL, its structure and impact. We describe the concrete policy options that have grown out of this initiative for the Swiss context, and also outline some general recommendations. Finally, we conclude by outlining the role of initiatives like the EHCL in sparking the much-needed change in public health education.

EVIDENCE

Global Evidence: Leadership Initiatives for Educating the Public Health Workforce

In the last few decades, there have been several initiatives that attempted to offer educational opportunities for public health professionals reflecting some of the features proposed by Bürkin et al. and teaching non-academic skills, like leadership. In Canada, the Emerging Health Leaders is a grassroots movement that created a network of medical professionals focused on leadership development [6]. It is active since 2006 and counts hundreds of members organised in different nodes (local-committees), which organise workshops, speed-mentoring opportunities and other educational events. In Australia, the Academy for Emerging Leaders in Patient Safety yearly brings together professionals aiming to develop their leadership skills, especially for reducing the impact of medical errors [7]. This program is organised around 4-day intensive and interactive workshops, where selected participants from the professional community join “discussions, interactive presentations, storytelling, games and communication skills [training]”. It has a flat hierarchy and is focused on transdisciplinarity and inter-professionality. In the United States, upon impulses from the American Cancer Society, the National School Health Coordinator Leadership Institute was created, with the objective of developing “training for a cohort of district-level school health staff with specific goals to improve the school health infrastructure of participating school systems” [8]. This included a training program with multi-day workshops, follow-up sessions and

community-building efforts over several years, addressing the development of various skills (organisational capacity, advocacy, etc.) for school health programming in participating institutions. Also in the United States, the Northeast Public Health Leadership Institute developed a comparable training opportunity, at the crossroad between academic and public health administrative institutions. Their educational offer consists in a “year-long experiential program aimed at building and improving the leadership skills of current and future public health practitioners” [9]. Their training is multidisciplinary and transprofessional and covers several topics (e.g., developing collaborative relationships, risk communication, team building, etc.). In China, a leadership training program focused around the core competences of public health and emergency preparedness identified by the American Centre for Disease Control and Prevention was developed and tested recently [10]. This included “case studies, workshops, tutorials, seminars, group discussions, role-playing, drilling, and fieldwork” (but avoided formal lecturing) on scientific, but also public communication and knowledge transfer skills.

Further initiatives of this kind are not listed here, but they have been studied and analysed in systematic reviews (e.g., [11]), but “reports on comprehensive healthcare leadership training programs (including interdisciplinary programs) are still scarce, no doubt a reflection of the paucity of such programs” [12].

Local Evidence: The EHCL Program

In Switzerland, the training of public health professionals has traditionally focused on academic and scientific competences and on the postgraduate level. The main actors in this field include the Swiss School of Public Health (SSPH+), a partnership between 12 higher education institutions to offer PhD students from many disciplines a curriculum in public health education through workshops, conferences and dedicated resources (e.g., own certificates of advanced studies and own scientific journals) [13, 14]. Moreover, some universities developed a conjoint public health study offer [15], and a national organisation on public health offers some workshops and training opportunities [16]. Since these initiatives are mostly focused on academic skills and the development of specific projects in the field, a new initiative was launched in 2018 to complement them, offer additional (mostly non-academic) public health skill-training and enhance community building. This initiative—the EHCL program—was created in the framework of the National Research Program (NRP) 74, a funding scheme by the Swiss National Science Foundation (SNSF), which—alongside funding topic-specific projects for generating evidence around smarter healthcare for persons with chronic conditions—explicitly attempted to foster the development of a health services and public health research community [17]. The rationale was the realisation that a well-coordinated community of researchers is crucial to spark innovative and transdisciplinary research projects and to enhance the communication between public health research, practice and politics.

The EHCL was “a pioneering needs-based training programme” [18] and was open to all early career-researchers

employed or involved in the research conducted as part of the 34 research-and-practice-oriented projects funded by the NRP74. Thanks to the resources of the NRP74, each eligible scholar could participate in the EHCL for free (activities were fully-funded and reimbursement for transportation to the workshops was covered), and on a voluntary basis. Over the years of its first phase, 57 early career researchers affiliated with research institution from the different language regions of Switzerland joined the EHCL. This is an important achievement given the decentralised structure of academic and healthcare system of Switzerland. The participants were mostly PhD students (65% of the scholars), Postdocs (14%) and other researchers including junior medical doctors (21%). Many academic/professional backgrounds were present (Biology, Clinical Psychology, Nursing, Medicine, Economics, etc.). The centre of the program was a coordinating office, which initially helped with the recruitment of participants and to set up the calendar and training program, and the NRP74 steering board, a panel of experienced professionals and researchers in public health to advise and offer recommendations. A key of the EHCL was the integration of top-down approaches with a participatory/bottom-up ones, whereby scholars were increasingly involved in actively conceiving and organising new events—in terms of topic and format. This participatory approach was particularly successful. For example, the Expert Visitor Grant Program was developed, which allowed EHCL scholars to propose events involving an expert coming to Switzerland to deliver specific training in one of the educational priority-areas collectively decided.

In practical terms, the EHCL implemented a series of training workshops, events and other initiatives, which were listed in a calendar published each year. Activities included a yearly multi-day retreat, and the possibility to set up specific personalised mentorship meetings with the EHCL coordinator and experts of the Swiss healthcare community. Training topics were centred around five main thematic areas: self-competences/leadership, professional competences, soft skills, knowledge transfer competences and social competences in the working environment. With respect to the format, the events had different lengths and structures, but there were two main common foundations: the desire to comply with the principles of adult learning, and the combination—in any training event/workshop—of a skill-development and a social part for community development.

As described elsewhere [19], the EHCL managed to organise an extensive training program with a limited budget and a lean management structure. Between 2018 and 2023 more than 40 formal events were set up, on top of a series of less formalised initiatives (e.g., spontaneous discussions on/offline between scholars, *ad hoc* mentorship sessions). These were mostly skill trainings and covered a variety of topics including: leadership vs. management, team-building, successful negotiations, conflict management, personal branding, translating from evidence to policy, interactions with politics at a local and national level, presentation skills and rhetoric, writing skills in the academic and lay public domains, preparation/management of grant proposals, interactions with the media, social media for health communication, video-conferencing skills, applied project management, budgeting,

etc. A full list of the events, their content, duration and name of instructors is presented in a specific detailed report [20]. Importantly, each event included a feedback-loop, whereby participating scholars could provide feedback both through short online satisfaction surveys distributed after the event, and also through the Advisory Board, a small group of selected scholars tasked to relate with the EHCL coordination office. Another key component of the EHCL was that each training event contained a social part: this consisted in shared meals before/after the event, visits to museums, short city-tours etc. This served to reach an important aim of EHCL: truly cementing the community of researchers and practitioners that were being trained. Indeed, the EHCL wanted to create a progressive increase of trust and collaboration amongst its members. This followed a step-wise approach, whereby—through the training events and the related social parts—scholars were encouraged to know and meet each other and learn about their respective skills/interests. With time, scholars were prompted to exchange ideas and start small scale collaborations, e.g., by organising some of the events for the community in cooperation with the EHCL coordinators. Finally, scholars were motivated to leverage synergies and start collaborative projects, through the availability of seed-funding. This process produced concrete and significant results, including the development of research and knowledge-transfer activities. For example, EHCL scholars worked together on a project concerning the impact of the COVID-19 pandemic on the use of primary care services [21] and also on an initiative aimed at reviewing the future trends concerning the development of the Swiss healthcare system [22]. Some other EHCL scholars initiated and then carried out a study on the influence of the COVID-19 on the use of mental healthcare in Switzerland, realised in collaboration with health insurances of the country (important stakeholders in Switzerland) [23]. Additional signs of the success of the EHCL for achieving of a sense of community-building are listed in the aforementioned report [20]. Overall, these experiences indicated that scholars expanded their professional network, developed trust and community ties and established informal connections (e.g., consulting peers about career choices). Finally, in recognition of the set of skills developed and of the new competences acquired, scholars joining a minimum number of events and skill-training workshops obtained a certificate. The certificated listed the trainings joined and the skills acquired and was signed by representatives of the NRP74 and the SNSF.

POLICY OPTIONS AND RECOMMENDATIONS

The Future EHCL and Lessons Learned

Finding concrete ways to improve public health education remains a challenge, in that designing innovative training programs involves a certain degree of risk and experimentation. Many countries and public health communities have started their own initiatives and it is important for policymakers who stand to interact with the

future public health workforce to consider and support such initiatives. Within the context of Switzerland, the EHCL program has been trying to fill a gap in the education of health professionals. We now reflect on this experience, focusing on lessons learned that can be useful for other countries (or supranational organisation) involved in reforming public health training.

The implementation of the EHCL was initially tied to a specific NRP, which are cyclical funding and implementation programs supported by the SNSF for a specific and limited number of years. However, given the success achieved by the EHCL, several stakeholders involved in its development or implementation—as well as its scholars—acted to ensure the lessons learned would not be lost. As such, the final report of the NRP74 recommended a continuation of the EHCL, which was also communicated to different stakeholders in policy and politics [24]. This opened up the possibility to continue the EHCL program, by institutionalisation of the training offer it elaborated. This evolution is in process, through a transitional phase in which the model of training of the EHCL will continue under the umbrella of the SSPH+. An example of this new program phase was the event titled “Advocacy and Lobbying in Public Health in Switzerland: Blessing or Curse?” which was organised in collaboration with several Swiss public health stakeholders, and featured two politicians expert in public health to discuss with scholars how to interact with politics [25]. The continuation built on the lessons learned during the EHCL, including: 1) coordinators should dedicate time/support to the scholars; 2) access should be free or low-cost; 3) there should be consensus on the priority content-wise of the training; 4) evaluation of long-term effects should be planned; 5) the community of scholars should be well-connected with national and international stakeholders; 6) scholars should be open for interdisciplinary dialogue (with policymakers and non-academic stakeholders). Whereas challenges remain (e.g., setting the criteria for participation in the community), it is important for policymakers and other stakeholders in public health to continue supporting—as well as monitoring—how such innovative training initiatives function. Support of this kind does not mean only providing funding, but rather acknowledging and leveraging the value of such initiatives by interacting with them and involving early healthcare leaders in projects they can contribute to with their expertise. A key to facilitate this process is for innovative training initiatives to be transparent and communicative with other stakeholders, both concerning their strengths and weaknesses. This is the reason why the EHCL made all of its achievements, results, and details fully available, in a report written in collaboration with a science journalist to ensure accessibility [20].

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CONCLUSION

Public health education needs reform, and many ideas have been proposed on how this could be achieved. Whilst examples of concrete initiatives for fostering training and community-building among early-career healthcare leaders exist, they are uncoordinated and there is a risk of not learning from the experiences that many of these pioneering programs accumulated. In this article, we summarised some of such initiatives and presented the setup and some results of the EHCL program from Switzerland. We shared the content and lessons learned from this experience, so that future national and international programs can learn from the successes and the pitfalls of existing training initiatives such as the EHCL.

AUTHOR CONTRIBUTIONS

AM, AU, MP, and RH conceived the manuscript and wrote the initial draft. This was reviewed and integrated by DM and ER, whose input was discussed and added. All authors contributed to the article and approved the submitted version.

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CONFLICT OF INTEREST

The authors declare that they were involved in the training program described in the manuscript, either as instructors, organisers or participants.

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Promoting Awareness of Data Confidentiality and Security During the COVID-19 Pandemic in a Low-Income Country—Sierra Leone

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Objectives: World Health Organization issued Joint Statement on Data Protection and Privacy in the COVID-19 Response stating that collection of vast amounts of personal data may potentially lead to the infringement of fundamental human rights and freedoms. The Organization for Economic Cooperation and Development called on national governments to adhere to the international principles for data security and confidentiality. This paper describes the methods used to assist the Ministry of Health in bringing awareness of the data ownership, confidentiality and security principles to COVID-19 responders.

Methods: The Sierra Leone Epidemiological Data (SLED) Team data managers conducted training for groups of COVID-19 responders. Training included presentations on data confidentiality, information disclosure, physical and electronic data security, and cyber-security; and interactive discussion of real-life scenarios. A game of Jeopardy was created to test the participant's knowledge.

Results: This paper describes the methods used by the SLED Team to bring awareness of the DOCS principles to more than 2,500 COVID-19 responders.

Conclusion: Similar efforts may benefit other countries where the knowledge, resources, and governing rules for protection of personal data are limited.

Keywords: data confidentiality, data security, data ownership, cybersecurity, training, Sierra Leone, Sierra Leone Epidemiological Data Team, SLED

INTRODUCTION

In November 2020, the World Health Organization issued Joint Statement by United Nations System Organizations on Data Protection and Privacy in the COVID-19 Response stating that collection of vast amounts of personal and sensitive data may potentially lead to the infringement of fundamental human rights and freedoms [1]. The Organization for Economic Cooperation and Development called on national governments to adhere to the international principles for data security and confidentiality [2, 3].

Sierra Leone is a West African country of 7.5 million people and is divided into sixteen districts and five regions [4]. Sierra Leone ranks 184 out of 193 countries and territories on the 2022 Human Development Index and is classified as low-income country by The World Bank [5, 6]. The healthcare system is resource-constrained and challenged by frequent infectious disease outbreaks, the 2014–2016 epidemic of Ebola Virus Disease, and the COVID-19 pandemic [7]. The Ministry of Health (MoH) oversees 29 hospitals and more than 1,200 peripheral health units [8].

The first case of COVID-19 was reported on the 30th of March 2020. It was followed by the national epidemic response measures, including lockdown, travel bans, and curfews [9, 10]. To promote data ownership, confidentiality, and security (DOCS) awareness, the MoH initiated training on the DOCS principles and issued a Data Security and Confidentiality Agreement for MoH COVID-19 responders. The training sessions were conducted by the Sierra Leone Epidemiological Data (SLED) Team. Since 2017, the SLED Team of Sierra Leonean data managers that was created by the MoH and supported by the US Centers for Disease Control and Prevention (CDC), has been assisting with management and use of the Sierra Leone Ebola Database (Database) and helping families through a family reunification program to identify graves of their loved ones who were lost during the epidemic [11, 12]. Since its inception, the SLED Team was trained on identification of personally identifiable information (PII) and DOCS by MoH and CDC specialists and through online courses, which enabled them to develop training materials to establish and strengthen this expertise more broadly in the country.

This paper describes the methods used by the SLED Team to assist the MoH in bringing awareness of the DOCS principles to MoH COVID-19 responders. Similar efforts may benefit other countries where the knowledge, resources, and governing rules for protection of personal data are limited [13].

METHODS

Training Materials

The DOCS materials were developed based on the training provided as part of 2018 3-day workshop for the Sierra Leoneans. DOCS sessions included presentations on PII recognition, principles of confidentiality and data ownership, information disclosure, electronic and physical data security, with discussions of real-life scenarios. Later, the DOCS sessions were delivered as a part of data management, surveillance, emergency management and other trainings to COVID-19 responders lasting 30 min to 3 h. A training module on principles of cyber security and an optional DOCS Jeopardy game were added to the training. To deliver basic DOCS information, the duration of a training session needs to be 2 h with 30 min for discussion.

DOCS Jeopardy

A game of DOCS Jeopardy was created to test the participant's knowledge and encouraged the attendees to think deeply about

real-life DOCS situations. The game included the following four categories: Confidentiality, Disclosure, Physical and Electronic Security, and PII. Generally, each question was based on a real-life scenario, such as, "You are a medical doctor in Connaught Hospital and one of your HIV positive patients proposed to your sister but has never revealed this information to her. What should you do?" Attendees participated in Jeopardy as individuals, but also worked in teams to answer the questions. The participants were awarded symbolic prizes, usually a piece of candy, for correct answers to encourage engagement. The DOCS Jeopardy game was received with great enthusiasm and resulted in thoughtful discussions. The DOCS Jeopardy game takes 1–3 h and was not always conducted due to allotted time constraints.

Data Security and Confidentiality Agreement

To ensure that COVID-19 responders understand their responsibility for unauthorized disclosure of PII, the MoH established a Data Security and Confidentiality Agreement that is required to be signed by attendees of DOCS training sessions. The Agreement states basic requirements for confidentiality protection, such as "I will not make any unauthorized copy, transfer, modification or purging of confidential information." It concludes with a note about disciplinary measures that may be taken if these requirements are willfully violated. Signed by the attendee, the agreements were collected by the supervisors. The text of the Data Security and Confidentiality Agreement is in **Supplementary Material S1**.

Memory Card

A Questions-and-Answers (Q&A) Memory Card was created, containing answers to typical questions asked by participants during the training sessions, such as "Why is the training on data ownership, confidentiality, and security being offered now?" The Q&A Memory Card was distributed at the end of each session for use by the attendees and for sharing with their co-workers. The Q&A Memory Card is presented in the **Supplementary Material S2**.

Training Evaluation Form

To assess pre-training knowledge, needs for training improvement and to understand challenges in maintaining DOCS principles, at the beginning and at the end of each session the SLED Team distributed a Training Evaluation Forms (Form). Completing the Form was voluntary and anonymous. The Form contains questions such as whether the presenter was engaging and easy to follow, or if the attendee would be able to maintain DOCS principles, and, if not, what were their challenges in maintaining DOCS. A template of the Training Evaluation Form is in **Supplementary Material S3**.

Training Report

After each DOCS session, one of the team members developed a training report that included date, place, and duration of the training, name of the organization, description of the attendees'

occupations, the questions asked and answers provided, and participants feedback and comments. These reports were used to identify gaps in knowledge, the need for data protection infrastructure, and to improve training delivery. A template of the Training report is in **Supplementary Material S4**.

Tracking System

A tracking system was created to keep records of completed DOCS training sessions and for planning purposes. The tracking system captures the following data elements: contact person name and email, requesting organization, address, and time of the training, planned and actual number of attendees, attendees' occupation, and comments.

Training Under COVID-19 Circumstances

Each training was conducted following COVID-19 precautions, such as social distancing and wearing masks. Online training to the attendees in the distant districts was conducted at the early stage of epidemic.

RESULTS

By October 2023, the SLED Team trained more than 2,500 healthcare workers and COVID-19 responders. The DOCS training was conducted as a part of the MoH, CDC, WHO, UNICEF, African Field Epidemiology Network (AFENET), and other organizations' trainings or workshops. The number of participants varied from 7 to 110, and included district medical officers, surveillance officers, data managers, laboratory sample collectors, and other healthcare workers and COVID-19 responders. All filled out pre-training evaluation forms ($n = 468$) indicated low or no knowledge of the DOCS principles with comments such as "No knowledge in data security and confidentiality" or "I have been uncertain about how to securely share sensitive data with colleagues."

In 33% (372 out of 1,110) of post-training evaluation forms, participants noted that they would like to have a follow-up training and gain more knowledge of DOCS. At each session, attendees expressed interest in the topic and initiated discussions about their ability and challenges to maintain the DOCS principles. These discussions led to development of the Q&A Memory Card and the Evaluation Form with a goal to assess major challenges.

Multiple concerns were expressed by the participants. Data ownership was a difficult concept for participants to understand, some believed that everyone working with data should be a data owner. Many participants described their challenges with electronic data security, from difficulties with memorizing changing passwords to the lack of secure file transfer protocols or encryption for safe data transfer. Physical security was also a challenge in some settings, such as no locked cabinets for the hard copies. Some participants were concerned that their supervisors may not be aware of the DOCS principles and may not appreciate their data security protection efforts.

Although no evaluation of the training impact on improving data confidentiality was conducted, many participants offered

suggestions on improving and expanding the scope of the DOCS training program, such as refresher training sessions, national DOCS educational program for all healthcare workers, appointment of MoH data confidentiality officers, and inclusion of DOCS in educational curriculum.

Online training that initially was provided to attendees in the distant districts experienced frequent interruption due to poor internet connection and other technical issues. These factors, and the novelty of the software and of distant learning for most of the participants, resulted in the loss of motivation and cancellation of online session. In these cases, instructors who were present in the training room switched to another training topic. As a result, online training was discontinued and only in-person training was provided.

DISCUSSION

This work documents and underscores the need to promote awareness of data confidentiality and security throughout the COVID-19 pandemic in Sierra Leone and provides details of trainings on the principles of ownership of data, maintaining data confidentiality and security. Starting with the early days of the COVID-19 pandemic, the SLED Team was able to train over 2,500 COVID-19 responders. Participants appreciated the trainings as they had low knowledge on DOCS prior to the trainings. They were enthusiastic in their motivation to apply the principles of DOCS and recommended dissemination of the trainings to all healthcare workers in the country.

Maintaining PII confidentiality is mandated by the Constitution of Sierra Leone [14], however, as in many other African countries [13], the rules governing the protection of personal data and mechanisms for enforcing them are limited. In this digital age, vast amounts of patient data are captured electronically. Although electronic data has its advantages, it also poses the challenge of maintaining its confidentiality. This challenge is more pronounced in responding to healthcare emergencies, such as Ebola Virus Disease or COVID-19. Previous studies [15, 16] have extensively described patients' concerns about unauthorized information disclosure. Having knowledge of these concerns and the DOCS principles is critical for healthcare workers.

The DOCS training program presents a solution to build an awareness of the responsible use of personal data to serve the essential need for data sharing. More efforts should be directed to implementation of these principles in the healthcare data managing practice.

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JK: Conceptualization, project administration, supervision, writing-review and editing; MV: Conceptualization, project administration, supervision, writing-review and editing; BB: Data analysis, methodology, project administration, validation, writing-original draft, writing-review and editing; KD: Data analysis, validation, writing-original draft, writing-review and editing; YG: Conceptualization, data analysis, methodology,

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SUPPLEMENTARY MATERIAL

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Unseen Obstacles: Gender Leadership Disparities in Public Health Academia

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Keywords: gender disparity in leadership, public health academia, leaky pipeline effect, higher education policy, inclusive policy-making

The World Federation of Public Health Associations (WFPHA) Global Public Health Education Benchmarking Project (GPHEBP) is designed to assess public health programs worldwide, fostering alignment among existing programs, schools, and institutions. Higher education globally faces significant challenges, such as addressing resource disparities, adapting to technological advancements, and fulfilling the dire need for interdisciplinary approaches [1, 2]. These challenges are intensified in the field of public health by the urgent need to ensure that teaching staff are experienced, competent, and capable of tackling global health threats such as pandemics, health inequities, and increasing man-made and natural disasters [3]. The WFPHA, a worldwide professional society of public health associations, addresses these issues through 11 working groups including the Public Health Education and Training Working Group (PETWG), which focuses on improving educational frameworks and ensuring that public health training equips future professionals to meet evolving global health challenges.

A paramount focus of the GPHEBP is the assessment of gender disparity in public health academia leadership to determine whether leaders are truly representative of the broader public health workforce. The project initially faced challenges in surveying gender comprehensively due to differing social norms across regions, requiring the study to specifically center on sex, defined as the biological characteristics that define humans as female or male [4]. A central hypothesis of the GPHEBP is that public health academia leadership should ideally mirror the global sex ratio—approximately 1:1—where men and women share leadership positions equally. Despite women representing around 70% of the global healthcare workforce (including public health) as a whole, women remain substantially underrepresented in leadership roles [5]. This disparity hinders the ability of public health systems to benefit from diverse leadership, which is essential for comprehensive health policy development and decision-making.

The GPHEBP project is designed to retrieve data from websites of accredited public health institutions measuring on a range of indicators including the man-to-woman ratio within leadership roles, particularly among deans. The diverse composition of the research team, including members from various academic, and professional backgrounds, hailing from different regions, further enriched the analysis. Project team members' diversity enabled the disparities to be discussed and approached with sensitivity to regional and cultural nuances, ensuring that the results reflect an authentically global understanding of sex identification using these parameters.

Findings reveal noticeable gender disparities in leadership, with **111 males (45%)** and **94 females (38%)** in public health leadership positions, while **13% of the leaders' sex remained unknown** due to a lack of publicly available visual or self-identifying information. These figures demonstrate the disproportionate representation of men in leadership, despite women's notable presence in the public health workforce.

Furthermore, the results show that while the Americas region (AMRO) has made progress toward gender parity in public health leadership, WHO regions like Africa (AFRO) and the Middle East

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(EMRO) still face significant challenges. However, since most of the data came from US and Europe-based institutions, the accuracy of region-specific conclusions is limited. This highlights the need for more inclusive research to better understand the barriers faced by women in leadership across diverse contexts.

ACADEMIA'S SMALLER GENDER DISPARITY

While gender disparities in public health leadership are evident, the project highlights that **academia has a smaller gender disparity** in comparison to clinical or policy-making leadership. However, this still falls short of true parity. The “leaky pipeline” phenomenon, where women’s progression slows at senior career stages, remains a significant barrier [6]. Women face additional challenges in reaching top positions due to systemic biases, lack of mentorship, and fewer opportunities for promotion [7].

Academia has made progress in promoting women yet the pace of change remains slow. This is largely because many institutions still lack transparency in hiring and promotion processes, perpetuating the underrepresentation of women in senior roles [8].

IMPLICATIONS OF GENDER DISPARITY

The lack of gender diversity in public health leadership undermines the effectiveness of health systems. Gender-diverse leadership has shown improved decision-making, particularly in areas affecting Sexual and Reproductive Health and Rights [9]. Balanced teams bring a wider range of perspectives to the table, which leads to more innovative solutions and better outcomes for communities.

The underrepresentation of women in leadership roles limits attention to inclusive health policy development on issues disproportionately affecting women, such as maternal health or gender-based violence. Failing to address gender disparities in leadership can reduce the productivity and innovation of public health organizations, which in turn affects the overall efficiency of health systems [10].

RECOMMENDATIONS FOR CHANGE

To tackle these disparities, the research team recommends several strategies informed by extensive research in public health leadership and gender disparities:

1. **Mentorship Programs:** Developing mentorship programs that specifically support women in advancing to leadership roles is crucial. Such programs can help bridge the gap by offering guidance and opportunities for career growth.

2. **Transparent Recruitment and Promotion Processes:** Ensuring transparency in hiring and promotion processes is essential for overcoming the barriers women face. Clear criteria and accountability mechanisms should be established to promote gender equity.
3. **Leadership Preparation:** Increased investment in leadership training programs tailored to women, especially in regions where gender disparities are most observed, can help prepare future female leaders.
4. **Context-Specific Solutions:** Given the regional variations highlighted by the data, it is essential to design context-specific solutions that address the unique challenges women face in different parts of the world, especially in conflict-affected or resource-limited settings. This includes addressing cultural and societal norms that hinder women’s progress in leadership roles, especially through policy solutions.

While there has been some progress toward equity in public health leadership, the findings of the study reveal that **considerable disparities remain**. With females holding only 38% of leadership roles and stark regional variations in representation, clearly more remedial work needs to be done. These disparities are shaped by various factors beyond gender alone, highlighting the need for an intersectional approach. Aligning public health leadership with the global sex ratio and promoting gender equity is not just a matter of fairness; it is crucial for enhancing the effectiveness and inclusive nature of global public health systems.

By implementing targeted interventions and fostering gender diversity in leadership, the public health sector can better respond to the complex health challenges of the 21st century. Gender equality is not a luxury that only wealthy nations should prioritize; it is a fundamental requirement for building equitable and resilient communities. Institutions must actively survey these disparities and develop practical solutions to bridge the gap within their contexts, advancing both fairness and effectiveness in public health leadership.

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MA wrote the manuscript, AS worked on the references, and both AS and GKS reviewed and provided input. All authors contributed to the article and approved the submitted version.

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Promoting Public Health Through Drone Sports Within Diverse Communities of Middle- and High School Students

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Keywords: public health, engagement, outreach, K-12 education, workforce development

INTRODUCTION

A long-standing challenge to sustaining a robust public health workforce has been ineffective recruitment of young minds. We implemented a successful middle- and high school student engagement program that married an introduction to public health to drone sports to create an interactive and age-appropriate experience.

Over the last decade or two, undergraduate public health programs have been established to introduce public health curriculum to students earlier in their education [1], and for bachelor's degree-holding public health practitioners to be prepared to enter the field immediately after graduation.

Data have shown that the undergraduate programs are racially and ethnically diverse; thus, these graduates better reflect the communities that public health serves. Using data from the National Center for Education Statistics, in 2020, 17% of undergraduate public health degree graduates were Hispanic/Latino, 15% were Black/African American, 13% were Asian, 4% were multiracial, and 1% were American Indian/Alaska Native; 45% of bachelor's degree holders in public health were White [2]. However, such sustained successes of undergraduate programs rely partly on early introduction to public health before college while students are in middle- or high school.

Outreach to pre-college students (kindergarten through 12th grade in the U.S., K-12) has long been adopted by major Science, Technology, Engineering and Math (STEM) organizations to inspire young students to enter STEM professions, and thus advance the future workforce [3]. There are numerous established partnerships between professionals and K-12 STEM education that allow for an introduction to the profession. These introductions are often through fun and exciting hands-on experiences such as exploding chemistry experiments, electrifying physics exhibits, laboratory tours of brains for neuroscience, or programming robots and other autonomous machines. However, public health has traditionally not been considered a STEM field and, therefore, is not included in such pathway programs for young students.

Using the engagement principles of existing STEM outreach and engagement programs, we sought to develop an inspiring, interactive STEM-based program for a racially diverse group of middle- and high school students that would allow us to promote public health as a field, a career option for the students, and to address community health needs. Here, we describe our successful pilot program for middle and high school students, which merged an introduction to public health with interactive drone piloting and provided a pragmatic approach to the intersection and application of STEM activities with public health.

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IDENTIFICATION OF THE LOCAL NEEDS FOR THE FUTURE OF PUBLIC HEALTH

Health indicators for the state of Minnesota, where this program was based, are strong and, in many respects, lead the nation. However, racial/ethnic disparities in this state are some of the most stark in the nation. For example, the state's infant mortality rate is less than the average for the nation (4.8 versus 5.4 infant deaths per 1,000 births) [4]. Yet, the American Indian/Alaska Native infant mortality rate is 2.1x higher than the state average, and that for African American/Black is 1.7x than the state average [4]. Societal determinants and behaviors, and not the construct of race, drive these disparities [5]. Therefore, our public health workforce ought to be diverse in order to adequately address such needs from diverse communities. To meet this need, we focused on community outreach, engagement, and partnerships with underserved and under-resourced communities in the metropolitan Minneapolis/St. Paul area of Minnesota.

COMMUNITY COLLABORATION

Our school of public health resides in a university that serves a land-grant mission, which is to provide resources, education, and opportunities to the communities of the state. As part of our mission, we provide pre-college activities (such as camps) to youth. These opportunities highlight the work of individual disciplines, but they are not simply intended to recruit students to the university. Instead, we aim to return knowledge to the communities where real transformative work can be accomplished. Therefore, our work with youth could not be done alone because we lack the community expertise.

Central to the success of our program was our engagement of community partners with long-standing relationships with community educators, stakeholders, and leaders. We focused on partnering with community organizations with an education focus to their mission. Two of the three were youth education and enrichment organizations that provided activities such as summer programs, mentoring, tutoring, and college preparation. The third youth program was a summer internship program based at the university but partners with an inner-city high school. Each organization had personnel who interacted with the students regularly and outside our public health program. These contacts were key to our program as they were able to address the needs of the students, which included things such as transportation, housing, and behavioral issues.

INNOVATIVE INTEGRATIVE CURRICULUM

Our public health curriculum for our five half-day camp focused on the role of drones in public health. Through didactic lectures and discussions, students were first introduced to key concepts in public health each day, which included population health, prevention, emergency preparedness, and vaccination programs. Then, each day, there was a substantive topic related to drones. Students learned how drones have been used to spray insecticide in malaria-endemic areas, how drones have been used to deliver blood

products to remote areas, how drones collect air pollution data, and how drone-collected data can be analyzed. Topics were chosen to represent the foundational areas of public health, including epidemiology, health policy, environmental health sciences, and biostatistics. Discussions were not restricted to drone use in public health. On the contrary, students frequently inquired about topics related to the disease, population, or how society impacts the health condition. Interspersed in the public health material was time learning about drones.

Students learned to pilot palm-sized, first-person view (FPV) quadcopter drones. These drones weigh roughly 3 ounces and can reach a maximum speed of 10 m.p.h. in beginner mode. They are used for competitive drone racing, an emerging e-sport in which pilots can compete nationally. As a pilot, and consistent with STEM education, students also learned of the circuitry of the aircraft, the composition of its parts, and the role of the battery.

Throughout the week, students developed a case-based scenario in which they could use their drones in a public health setting. The exercise was to develop a drone-related intervention that could be used in a specific population to prevent a large-scale public health emergency. The resultant scenario was used as a basis for the drone race that concluded the week-long camp.

Conclusion

We have successfully bridged an introduction to public health with drone racing, an amusing hands-on STEM-based activity. Students in our pilot program gained an appreciation for public health work, and nearly all of them would consider a career in public health. Our program is particularly impactful given the diverse students reached. We are preparing to scale-up our program and offer our curriculum to students in additional underserved communities.

AUTHOR CONTRIBUTIONS

RN, IR, MA, and MW contributed to implementation of the project. RN and MW contributed to all aspects of the project, including development of the curriculum. All authors contributed to the article and approved the submitted version.

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CONFLICT OF INTEREST

MW is CEO and co-founder of the community-based business that provided the drone racing curriculum and instruction.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Healthcare Access vs. Quality Healthcare: Rethinking Healthcare Risks

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Objectives: This narrative literature review examines the global burden of mortalities due to poor quality care compared to mortalities resulting from lack of access to healthcare, focusing on the period from 2015 to 2024.

Methods: Data was extracted from electronic databases such as PubMed, Google Scholar, Scopus, Ebscohost, and WHO. Relevant statistics on mortality rates due to poor quality care and lack of access to healthcare from the identified data sources were extracted. Descriptive statistics were used to summarize the mortality rates, with trends analyzed over the 10 years.

Results: The results indicate that while progress in healthcare access has reduced mortality, the lack of corresponding improvements in care quality has led to a rising number of preventable deaths. The findings reveal a consistent decline in mortality due to lack of access. In contrast, mortality due to poor quality care has increased from 5 million in 2015 to an estimated 6 million by 2024, underscoring the persistent challenges in healthcare delivery, including medical errors, misdiagnoses, and inadequate treatment.

Conclusion: Addressing the dual challenges of access and quality is essential for reducing global mortality rates and achieving better health outcomes.

Keywords: adverse events, patient safety, quality improvement, healthcare access and quality index (HAQ), lack of access to care

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INTRODUCTION

In recent years, the global healthcare landscape has experienced significant transformations driven by advancements in medical technology, policy changes, and the increasing burden of chronic and infectious diseases. Traditionally, much of the public health discourse has been on improving access to healthcare services, particularly in low- and middle-income countries (LMICs). However, there is an emerging argument that the risks associated with accessing healthcare in specific contexts may now outweigh the risks of having limited or no access to healthcare. Historically, the emphasis on improving healthcare access has been driven by the recognition that millions of people, especially in LMICs, face significant barriers to obtaining necessary medical care. These barriers include financial constraints, geographic isolation, and insufficient healthcare infrastructure [1]. Efforts to address these issues have led to initiatives such as the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs), which prioritize universal health coverage (UHC) as a means of reducing health disparities [2]. While the lack of access to healthcare remains a critical issue, the risks associated with healthcare access have become increasingly apparent. Inadequate

healthcare systems, poorly trained workers, and substandard medical practices can significantly harm patients. This has led to a growing concern that, in some cases, accessing healthcare may expose patients to more significant risks than not seeking care [3].

Patient safety has emerged as a primary concern in healthcare systems worldwide. The World Health Organization (2019) estimates that medical errors and unsafe practices are responsible for millions of deaths each year, making patient safety a global public health priority [4]. In high-income countries, about one in ten patients is harmed while receiving hospital care, while the situation in LMICs is often more dire due to weaker healthcare systems and oversight [5]. Adverse events in healthcare settings can range from medication errors, surgical complications, and hospital-acquired infections to misdiagnoses and delayed treatment. The consequences of these errors can be severe, leading to prolonged hospital stays, permanent disability, or death [3]. These risks challenge the assumption that accessing healthcare is always beneficial, as the potential for harm in some settings may outweigh the benefits of treatment.

Negative or poor attitudes from healthcare staff contribute to poor patient interactions, reduced trust, and lower patient satisfaction. When staff are overworked or lack empathy, it can result in rushed consultations, miscommunication, and a lack of patient-centered care, ultimately compromising patient outcomes [6]. Long waiting times are causing frustration and anxiety among patients, leading to dissatisfaction with the healthcare experience. Long waits can also delay diagnosis and treatment, worsening health conditions [7]. Additionally, prolonged waiting times can strain healthcare resources, leading to rushed appointments and increased risk of errors.

Healthcare-Associated Infections (HAIs)

One of the most significant risks associated with accessing healthcare is the potential for healthcare-associated infections (HAIs). HAIs are infections that patients acquire while receiving treatment for other conditions within a healthcare facility. These infections are often caused by bacteria, viruses, or other pathogens resistant to antibiotics, making them difficult to treat [8]. The prevalence of HAIs is particularly concerning in LMICs, where infection control practices may be inadequate due to resource constraints. In these settings, the risk of acquiring an HAI can be substantial, leading to increased morbidity and mortality [9]. For example, studies have shown that the prevalence of surgical site infections is significantly higher in LMICs compared to high-income countries [10]. This highlights the paradox where accessing healthcare intended to treat one condition may result in acquiring another, potentially more severe, illness.

Antimicrobial Resistance (AMR)

Antimicrobial resistance (AMR) is another critical issue that amplifies the risks associated with accessing healthcare. The overuse and misuse of antibiotics in healthcare settings have contributed to the emergence of drug-resistant pathogens, now a major global health threat [4]. Patients who access healthcare, particularly in settings where infection control is lax, may be at

risk of contracting infections that are resistant to standard treatments. The spread of AMR is particularly problematic in LMICs, where surveillance and regulation of antibiotic use may be limited. In such environments, healthcare facilities can become hotspots for transmitting resistant pathogens, posing a significant risk to patients seeking care [11]. The rise of AMR complicates the management of common infections and undermines the effectiveness of surgical procedures, chemotherapy, and other medical interventions that rely on effective antibiotics [12].

Moral and Ethical Dilemmas

The risks associated with healthcare access also raise moral and ethical dilemmas for healthcare providers, policymakers, and patients. Healthcare providers face the challenge of delivering care in environments where resources are scarce and the potential for harm is high. This can lead to difficult decisions about providing treatment that may carry significant risks or withhold care altogether [13]. For patients, particularly those in vulnerable populations, seeking healthcare may involve weighing the potential benefits against the risks of harm. In some cases, the fear of medical errors, infections, or other adverse events may deter individuals from accessing healthcare, even when they require treatment [14, 15]. This creates a paradox where the availability of healthcare does not necessarily translate into improved health outcomes.

Healthcare in Conflict Zones

The risks associated with accessing healthcare are particularly pronounced in conflict zones, where healthcare infrastructure is often severely compromised. In these settings, healthcare facilities may be targets of violence, and the quality of care can be severely degraded. Patients who seek treatment in conflict zones may be exposed to additional risks, including physical harm, psychological trauma, and inadequate medical care [16]. For example, in Syria, healthcare facilities have been repeatedly targeted during the ongoing conflict, leading to a collapse of the healthcare system in many parts of the country. Patients who seek care in these areas may be at greater risk of harm due to the destruction of medical facilities, shortages of medical supplies, and the absence of trained healthcare workers [16, 17]. This underscores the argument that, in some contexts, healthcare risks may be more significant than the lack of access.

Maternal and Child Health in LMICs

Maternal and child health services in LMICs provide another lens to examine the risks of accessing healthcare. While efforts to improve access to maternal and child health services have successfully reduced mortality rates, significant risks remain associated with the quality of care provided [18, 19]. In many LMICs, healthcare facilities may lack the necessary equipment, supplies, and trained personnel to provide safe and effective care for mothers and children. This can lead to adverse outcomes such as obstetric complications, neonatal infections, and maternal mortality [20]. The risk of receiving substandard care is particularly high in rural and remote areas, where healthcare infrastructure is often weak. As a result, women

TABLE 1 | Mortalities due to lack of access to care and poor-quality care: a ten 10-year global trend analysis (2015–2024).

Year	Mortality due to lack of access to healthcare	Mortality due to poor quality care
2015	- Estimated Deaths: 5 million annually (globally) - Significant deaths in LMICs due to barriers like financial constraints and geographic isolation - Source: [2]	- Estimated Deaths: 5 million annually (globally) - High mortality due to medical errors, misdiagnoses, and inadequate treatment - Source: [1]
2016	- Estimated Deaths: 4.8 million annually (globally) - Continued reduction due to global health initiatives - Source: [6]	- Estimated Deaths: 5.2 million annually (globally) - Rising deaths from inadequate healthcare quality - Source: [6]
2017	- Estimated Deaths: 4.6 million annually (globally) - Further improvements in healthcare access - Source: [6]	- Estimated Deaths: 5.4 million annually (globally) - Increasing mortality from poor quality care - Source: [6]
2018	- Estimated Deaths: 4.5 million annually (globally) - Persistent issues in rural and remote areas - Source: [21]	- Estimated Deaths: 5.5 million annually (globally) - Ongoing challenges in delivering consistent and safe care - Source: [6]
2019	- Estimated Deaths: 4.3 million annually (globally) - Significant impact of global health efforts to improve access - Source: [6]	- Estimated Deaths: 5.6 million annually (globally) - Growing recognition of the need for quality care - Source: [6]
2020	- Estimated Deaths: 4 million annually (globally) - COVID-19 pandemic caused a temporary increase in mortality - Source: [6]	- Estimated Deaths: 5.7 million annually (globally) - The pandemic exacerbated gaps in healthcare quality - Source: [6]
2021	- Estimated Deaths: 3.9 million annually (globally) - Healthcare systems began recovering post-pandemic - Source: [22]	- Estimated Deaths: 5.8 million annually (globally) - Continued strain on healthcare quality due to pandemic aftereffects - Source: [6]
2022	- Estimated Deaths: 3.7 million annually (globally) - Renewed efforts to improve healthcare access - Source: [22]	- Estimated Deaths: 5.9 million annually (globally) - Persistent challenges in delivering high-quality care - Source: [6]
2023	- Estimated Deaths: 3.6 million annually (globally) - Continued reduction, but disparities remain - Source: [22]	- Estimated Deaths: 6 million annually (globally) - Ongoing issues with healthcare safety and effectiveness - Source: [6]
2024 (Projected)	- Estimated Deaths: 3.5 million annually (globally) - Persistent challenges in reaching the most vulnerable populations - Source: [22]	- Estimated Deaths: 6 million annually (globally) - Quality of care remains a critical issue, especially in LMICs - Source: [6]

and children who seek care in these settings may be exposed to more significant risks than if they had received no care at all.

METHODS

This study is a narrative literature review in which data was extracted from electronic databases such as PubMed, Google Scholar, Scopus and Ebscohost relevant websites of key international organizations such as the World Health Organization (WHO), the Global Health Observatory (GHO), the World Bank, and the United Nations (UN), which are pivotal in global actions and strategies for patient safety. Data collection involved extracting relevant statistics on mortality rates due to poor quality care and lack of access to healthcare from the identified data sources. The study focused on annual mortality rates, disaggregated by global regions, and specific causes of death associated with healthcare access and quality. For mortality due to poor quality care, data on medical errors, misdiagnoses, healthcare-associated infections, and substandard treatment were collected. For mortality due to lack of access, data on deaths from preventable diseases, maternal and child health outcomes, and untreated chronic conditions were gathered. The data collection process also involved reviewing literature on global health trends to contextualize the quantitative data.

The analysis was conducted in two phases. The first phase involved a quantitative analysis of the mortality data. Descriptive statistics were used to summarize the mortality rates, with trends analyzed over the 10 years. The study compared mortality due to poor quality care versus lack of access to healthcare, identifying key patterns and shifts in global health priorities. A qualitative analysis was conducted in the second phase to interpret the quantitative findings. This involved reviewing the literature to understand the underlying factors contributing to the observed trends. The qualitative analysis focused on how global health initiatives, healthcare system reforms, and technological advancements impacted mortality over time. The comparative analysis highlighted the differences in mortality burdens between poor quality care and lack of access across different regions and periods.

This study is based on secondary data and does not involve direct interaction with human subjects. However, ethical considerations were still prioritized by ensuring that all data sources were reputable and that data was handled responsibly. The study adhered to ethical guidelines for using secondary data, including proper attribution of sources and ensuring the accuracy and reliability of the data presented. The research findings aim to inform global health policy and practice, contributing to efforts to reduce preventable deaths through improved healthcare access and quality.

Comparison of Mortality due to Lack of Access to Care and Poor-Quality Care: A Ten 10-year Global Trend Analysis (2015–2024).

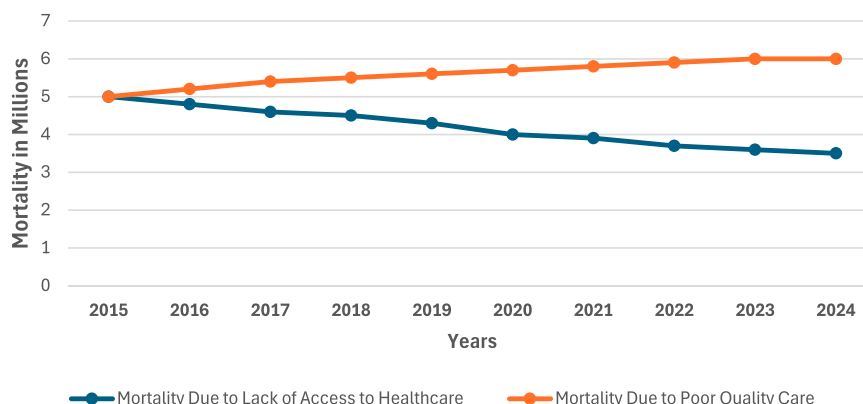


FIGURE 1 | Comparison of mortality due to lack of access to care and poor-quality care: a ten 10-year global trend analysis (2015–2024).

RESULTS

A data review shows a consistent decrease in mortality due to lack of access to healthcare, from 5 million in 2015 to a projected 3.5 million in 2024 (**Table 1**; **Figure 1**). Thanks to global initiatives aimed at expanding healthcare coverage. However, as access improved, the focus shifted to the quality of care provided, revealing that poor quality care was becoming a leading cause of preventable deaths. The data shows that while the number of deaths due to lack of access decreased from 5 million in 2015 to a projected 3.5 million in 2024, deaths from poor-quality care increased from 5 million to 6 million in the same period (**Table 1**; **Figure 1**). This trend highlights the growing importance of healthcare quality as a determinant of health outcomes. Even as more people gain access to healthcare, ensuring that their care is effective, safe, and of high quality is crucial in reducing global mortality rates.

DISCUSSION

The assertion that the risk of accessing healthcare has become far greater than the lack of access to healthcare raises essential questions about balancing efforts to improve access with the need to ensure quality and safety in healthcare delivery. While increasing access to healthcare remains a critical goal, it is equally important to address the systemic issues contributing to the risks of harm in healthcare settings [6, 23]. One approach to achieving this balance is to strengthen healthcare systems by investing in quality improvement initiatives, enhancing healthcare worker training, and implementing robust infection control measures. Additionally, there is a need for greater regulation and oversight of healthcare practices, particularly in LMICs, to ensure patients receive safe and effective care [21].

The Role of Health Policy and Governance

Health policy and governance play a crucial role in mitigating the risks associated with healthcare access. Governments and health authorities must prioritize patient safety and quality of care in their healthcare policies and programs. This includes establishing national frameworks for patient safety, setting standards for healthcare delivery, and ensuring accountability in healthcare systems [24]. In addition to policy efforts at the national level, international organizations such as the WHO can provide guidance and support to countries in developing and implementing patient safety strategies. Collaboration between governments, healthcare providers, and civil society organizations is essential to create a healthcare environment where the risks of harm are minimized, and the benefits of care are maximized [4].

Ethical Implications and Patient Autonomy

The risks associated with accessing healthcare also have ethical implications, particularly concerning patient autonomy. Patients have the right to make informed decisions about their healthcare, including accepting or declining treatment based on understanding the risks and benefits. However, in many cases, patients may not have access to the information or support they need to make these decisions, particularly in resource-limited settings [25]. Healthcare providers have an ethical responsibility to ensure that patients are fully informed about the potential risks of treatment and to involve them in the decision-making process. This includes providing clear and accurate information about the likelihood of adverse events, the availability of alternative treatments, and the potential outcomes of not receiving care [21, 23, 26]. By respecting patient autonomy and promoting shared decision-making, healthcare providers can help mitigate the risks of accessing healthcare.

Addressing the Root Causes

Addressing the root causes of these risks is essential to reduce the risks associated with accessing healthcare. This includes tackling the underlying social, economic, and political factors contributing to healthcare system weaknesses and patient vulnerability. For example, addressing poverty, improving education, and strengthening health infrastructure can help create a more resilient healthcare system better equipped to provide safe and effective care [23, 27, 28]. Moreover, efforts to combat AMR, improve infection control practices, and enhance healthcare worker training are critical to reducing the risks of harm in healthcare settings. By addressing these root causes, policymakers and healthcare providers can work towards a healthcare system where the risks of accessing care are minimized, and the benefits of treatment are maximized [11].

The Future of Healthcare Access and Safety

Looking to the future, the risks associated with healthcare access must be a central consideration in the ongoing efforts to improve global health. As healthcare systems continue to evolve, there will be a need for ongoing monitoring and evaluation of patient safety and quality of care. This will require developing new tools and methodologies for assessing healthcare risks and integrating patient safety into broader health system strengthening efforts [4]. In addition, there is a need for more research and innovation in healthcare delivery, particularly in LMICs, where the risks of harm are often highest. This includes exploring new models of care that prioritize patient safety and developing technologies and interventions that can reduce the risks associated with healthcare access [21, 23, 26].

The assertion that the risk of accessing healthcare is becoming far greater than the lack of access to healthcare

highlights the complex and multifaceted nature of healthcare delivery in the modern world. While access to healthcare remains a fundamental goal, ensuring that the care provided is safe, effective, and high-quality is equally essential. The risks associated with healthcare access, including patient safety concerns, healthcare-associated infections, and antimicrobial resistance, must be addressed through concerted efforts at the policy, governance, and practice levels. Ultimately, the goal should be to create a healthcare system where patients can access the care they need without fear of harm and where the benefits of treatment far outweigh the risks. This will require a continued commitment to improving healthcare quality, strengthening healthcare systems, and addressing the root causes of healthcare risks.

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Building Capacity of Public Health Workforce in the Global South Through Humphrey Fellowship

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INTRODUCTION

Practitioners from the global south have demonstrated incredible resilience and adaptability in addressing public health crises like Ebola and COVID-19 [1]. Despite lacking substantial resources, they have implemented localized solutions which garnered universal acclaim. Yet, they face significant challenges due to limited access to education and professional development opportunities compared to others. This disparity is often worsened by inequalities that curb the capacity for capacity development [2]. Investing in the skills of public health workers and building partnerships improve the capacity of local health systems to respond to emergencies. Bolstering these capacities through fellowships and collaborative initiatives can bridge the gap between the Global North and South, leading to more equitable health outcomes worldwide.

There already exists a number of fellowship programs in the area of global health. For example, the HGHI Burke Climate and Health Fellowship program supports professionals with research at the intersection of climate change and global health [3]. The Global Surgery Fellowships aims to improve access to surgical care worldwide [4]. The Public Health Informatics Fellowship Program (PHIFP) offered by CDC focuses on building a robust team of health informatics professionals across the globe [5]. Atlantic Fellows for Health Equity is another US-based fellowship that is focused around for professionals interested in the field of health equity [6]. The NIHR Global Advanced Fellowship supports postdoctoral researchers in advancing their careers in global health research [7].

The Humphrey Fellowship Program discerns itself from other fellowships by offering a non-degree, tailored experience for mid-career professionals. Unlike research-focused programs, it combines academic coursework with flexible professional development opportunities sans the rigors of pursuing a traditional degree. Post-fellowship, individuals return to their native country with a global network and improved skills to come up with effective solutions to health challenges. This article discusses the program's unique structure, the transformative journeys of fellows, and their contributions to global health.

STRUCTURE OF THE HUBERT H. HUMPHREY FELLOWSHIP

The Hubert H. Humphrey Fellowship Program was initiated in 1979 by the former United States President Jimmy Carter to honor the late senator and former US vice president Hubert H. Humphrey. The program brings mid-career professionals from 163 countries (mostly from the

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Category	Organization name
Non-Profit	The Task Force for Global Health (TFGH) -Brighton collaboration -Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET) -Public Health Informatics Institution (PHII) Food Fortification Initiative (FFI) The Carter Center Catholic Relief Services Embrace Refugee BirthGaPQC (Georgia Perinatal Quality Collaborative) FHI 360
Healthcare Facilities	Emory Healthcare Grady Memorial Hospital
Federal/Government	CDC (Centers for Disease Control and Prevention)
Academia	LEADER LAB (Laboratory for Exposure Assessment and Development in Environmental Research) Center for Contemplative Science and Compassion-Based Ethics Emory Global Health Institute University of Washington Emory Global Diabetes Research Center Georgia State University School of Public Health Emory School of Medicine, The Global Collaborating Center for Perinatal Equity Human Engagement Learning Platform for Global Health (RSPH) Emory University
UN	Pan American Health Organization: PAHO/WHO
Private	ESRI (Environmental Systems Research Institute)

FIGURE 1 | Organizations that have regularly hosted Humphrey Fellows for their professional affiliation in areas of global health (Compiled by the authors).

global south) to the United States for a duration of 10 months [8]. The program is administered by the Institute of International Education and funded by the U.S. Department of State. Among the impact areas of the program, “Public Health Policy and Management” is one that has really stood out over the years.

The individuals selected for this fellowship at partner institutions such as Emory University, Virginia Commonwealth University (VCU), Tulane University, and Johns Hopkins University (JHU) have not necessarily followed a linear path in public health, but often came from a diverse path.

TAILORED LEARNING THROUGH CLASSROOM EXPERIENCES AND SKILL-BUILDING WORKSHOPS

At host universities, fellows have the opportunity to take graduate-level courses on pandemic preparedness, one health, non-communicable diseases, nutrition, transforming surveillance and many other topics. However, as Elisaveta Petrova-Geretto (Emory University, 2021–2022) attested,

fellows may also take classes from other departments if there is an interest.

Additionally, Humphrey Seminars provides fellows with weekly sessions on timely public health issues led by subject matter experts. It also strengthens the leadership and technical capacity through immersive training workshops typically held in different US cities. Eman Salih (Emory University, 2022–23) from Sudan underlined the life-saving guidance she could offer during a national crisis due to her crisis leadership training. Dr. Bani (JHU, 1988–1989) from Sudan credits the fellowship’s leadership training with preparing him for high-responsibility roles like the Deputy Head of the Nutrition Sector for all UN agencies in Darfur.

MENTORSHIP

Early in their fellowship, individuals are connected with a mentor who facilitates the process of finding potential collaborators within host academic institutions and beyond, during and even after the fellowship. Regarding mentorship, Dr Bani said, “I worked closely with my mentor, Professor Timothy Baker to

design my program for the year. It was an incredibly enriching experience.”

FIELD VISITS

The program has collaborated with various organizations which range from federal agencies like CDC to small volunteer organizations. Direct interaction with C-suite executives and directors at these organizations through weekly visits offers insights far beyond the standard student experience.

PROFESSIONAL AFFILIATION

Fellows at Emory University (presently the sole host institution) benefit from the institution’s location at the “public health capital of the world,” Atlanta which is home to US Centers for Disease Control and Prevention (CDC), departments of public health, and well-known non-profit organizations.

Through the professional affiliation component, fellows engage in part-time work with US-based organizations (**Figure 1**). Several fellows have gone on to foster long-lasting partnerships with them.

Building on her professional affiliation at the Focus Area for Compassion and Ethics (FACE) program, Elisaveta is presently researching informed consent in public health with the focus of vaccination consent. She also plans to host compassion seminars and discuss compassion in healthcare in three hospitals jointly with the FACE team who will travel to Bulgaria. She is also planning on organizing global health-themed case competitions, learning from her experience at Emory University. Furthermore, she has also begun working on an LGBTQIA+ guidebook for inclusive language in healthcare.

Through her Professional Affiliation, Daisy Vargas Méndez from Panama (VCU, 2022–2023) learned about motivational interviewing, a crucial skill for professionals in mental health and counseling. Another big takeaway for her was the understanding of the operations and management at recovery centers in the United States.

Henry Espinoza (VCU, 2022–23) worked with a local VCU-based lab conducting research on mental health and substance use. He explored and validated different tools and reviewed literature to understand the project. Now working with a local NGO in Nicaragua, he applies the skills gained during his time in Virginia. His career, primarily focused on sexual and reproductive health, has now expanded to include substance use during pregnancy. This comprehensive expertise makes him highly competent in addressing these critical issues.

Dr. Ibrahim Bani’s professional affiliation experience at the World Bank helped him develop networking skills and leverage many opportunities. He says, “After the fellowship, I collaborated on a micronutrient deficiency project in Darfur, which was supported by Nutrition International. We developed a premix product containing essential nutrients for women and children in displaced communities. The project was a success and was presented at various international conferences.”

CONTINUED CAPACITY BUILDING OPPORTUNITIES AND FELLOWSHIP-SUPPORTED PROJECT

Even after the fellowship duration, fellows are supported in their endeavors to upskill and implement impactful projects in their field. The Professional Development Grant enables fellows to attend conferences/workshops to further develop their skills and networks while the Alumni Impact Award (AIA) encourages fellows to pursue relevant projects in their home country. Richard, through the latter, implemented a project aimed at promoting mental health awareness among university students in Kilimanjaro, Tanzania while also facilitating youth-focused activities in the intersection of climate change and health.

CONCLUSION

The platform empowers fellows to make significant contributions to the enhancement of global health outcomes. By building the capacity of the global health workforce around the world, the Humphrey Fellowship program catalyzes positive change and fosters lasting impact in communities worldwide.

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MP is the first author; conceived the initial idea and edited the final draft. SC, HM, ES, and RK are second authors with equal contribution. All authors contributed to the article and approved the submitted version.

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Public Health Education and Training in Viet Nam: Adaptations Are Needed for Better Responses to New Public Health Needs

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Public health has been defined as “the science and art of preventing disease, prolonging life, and promoting health through the organized efforts of society” [1]. Public health plays a crucial role in improving community health by achieving goals related to disease prevention, promoting the implementation of beneficial behaviors to reduce the risk of infectious, non-communicable, and injury-related diseases, and ensuring that the community has access to healthcare services of good quality [2–5].

According to the World Health Organization (WHO), public health has 12 Essential Public Health Functions (EPHFs), the minimum requirements for Member States to ensure community health in a comprehensive, integrated, and sustainable manner [3, 4]. In 2024, WHO recommended competencies in 20 core areas across six domains, with 74 specific and 28 leadership behaviors [6]. In the latest update, the WHO has added three new functions: EPHF2 (Public health emergency management); EPHF5 (Health protection), and EPHF12 (Access to and utilization of health products, supplies, equipment, and technologies) [6]. At the same time, it has emphasized equity in the quality function and in the provision of health services and Multisectoral planning in the function of Multisectoral planning financing and management for public health [6]. This framework has guided many countries in developing competency-based public health training programs.

In Vietnam, public health education began in 2001 with the establishment of the Hanoi School of Public Health (HSPH), and became one of the first universities to offer the Bachelor of Public Health (BPH) in Vietnam. National competency standards for BPH were developed based on international references, local regulations, and Vietnam’s public health context [7, 8]. These include eight standards, focusing on public health science, analysis, policy development, communication, leadership, and cultural diversity. Each standard has specific criteria for evaluation, totaling 50 criteria, with 30 core ones tailored to Vietnam’s public health needs [9].

Nowadays, public health education and training in Vietnam have been more widely implemented nationwide. BPH, Master of Public Health (MPH), and PhD in Public Health (PhDPH) training programs have been developed and conducted by the Hanoi University of Public Health (formerly

the HSPH, which is the unique training institution specialized in public health in Vietnam) and faculties or departments of Public Health within nearly 20 medical universities/schools in the country.

In general, compared to the WHO's EPHFs 2024 [6], all of the three formal training programs (BPH, MPH, and PhDPH) have fully covered the subfunctions of EPHFs 1, 6, 7, and 8 [6] (i.e., *Public health surveillance and monitoring*, *Disease prevention and early detection*, *Health promotion*, and *Community engagement and social participation*).

The BPH training program meets 10 of 12 EPHFs and 27 of 48 subfunctions in the WHO's 2024 EPHF [6] list. It does not fully address EPHF9 (*Public health workforce development*) and EPHF12 [6]. Minimal coverage is noted in EPHF2 (1/5 subfunctions), EPHF3 (1/4 subfunctions), and EPHF4 (2/5 subfunctions) [6], indicating gaps in emergency preparedness, governance, and cross-sectoral planning.

The MPH training program addresses 11 of 12 EPHFs and 32 of 48 subfunctions [6], falling short in EPHF12 [6]. Compared to the BPH program, it covers five additional subfunctions. These include subfunction 4.2 in EPHF4 [6] (promoting cross-sectoral public health planning with WHO's Health in All Policies approach) and subfunction 5.1 in EPHF5 [6] (developing and enforcing regulatory frameworks for protecting populations from health hazards). In EPHF9 [6], the MPH program fulfills subfunction 9.1 [6] (planning and evaluating the public health workforce) and subfunction 9.2 [6] (developing workforce education and training across competencies, including intersectoral work and emergency response). Additionally, it addresses subfunction 10.2 in EPHF10 [6] (promoting equity in access to health and social care services). These achievements highlight the MPH program's focus on cross-sectoral collaboration, workforce development, and equity promotion. However, addressing EPHF12 [6] remains a critical area for improvement.

The PhDPH training program addresses 11 of 12 EPHFs [6] and 36 of 48 subfunctions but does not meet EPHF12 [6]. Compared to the MPH program, the PhDPH program covers four additional subfunctions. These include subfunction 2.2 in EPHF2 [6] (planning and building capacity for public health emergency preparedness and response with intersectoral collaboration) and subfunction 2.5 [6] (engaging communities and stakeholders across sectors for public health emergency management). In EPHF3 [6], the PhDPH program also addresses subfunction 3.3 [6] (developing, monitoring, and evaluating public health regulations and laws as frameworks for governance and services). Additionally, it fulfills subfunction 11.3 in EPHF11 [6] (promoting integrating public health operational research into broader research agendas). The PhDPH program demonstrates greater alignment with emergency preparedness, governance, and research prioritization than the MPH program. However, addressing EPHF12 [6] remains a shared gap across all training programs.

Of the three new EPHFs added in 2024 (EPHF2, 5, and 12 [6]), none of the training programs address EPHF12 [6]. The MPH and PhDPH programs meet all three subfunctions of EPHF5 [6], while

the BPH program does not fulfill subfunction 5.1 [6] (developing and evaluating regulatory frameworks to protect populations from health hazards). Regarding EPHF2 [6], the BPH and MPH programs meet only subfunction 2.1 (monitoring and analyzing public health information to identify and prioritize risks, including emergencies). In contrast, the PhDPH program addresses three of the five subfunctions of EPHF2 [6]. These include subfunction 2.1, subfunction 2.2 [6] (planning and building capacity for emergency preparedness and response as part of routine health systems with intersectoral collaboration, including a national emergency response operations plan), and subfunction 2.5 [6] (engaging communities and stakeholders across public, private, and allied sectors in a whole-of-society approach to emergency management). While progress is evident in EPHFs 2 and 5, the gap in addressing EPHF12 [6] highlights an area for improvement in all training programs, particularly in ensuring access to and utilization of essential health products, supplies, and technologies. The findings underscore the need for further curriculum alignment with the comprehensive EPHF framework.

The above comparisons between the public health education and training programs in Vietnam with the requirements of WHO's EPHFs in 2024 [6] highlight the need for further adaptation of these programs in Vietnam. These comparisons also serve as a basis to help universities propose improvements to the existing training programs and develop future short-term courses to respond to the changing public health context after the COVID-19 pandemic, globalization, and the digital era.

At the macro level, an overall review of the WHO's EPHFs 2024 [6] is needed to identify the functions and services that the public health workforce in Vietnam can perform appropriately in the given context. According to the WHO [10], it is recommended to identify the current status of EPHF implementation, consider EPHFs in the health sector and other related sectors, and identify workforce groups that can perform part or all of the EPHFs to achieve universal health coverage, health security, and health improvement. This is also an opportunity for Vietnam to review the competency standards of BPH to adjust the necessary competencies for those workforce groups so that they can respond to the changes following the COVID-19 pandemic.

At the micro level, education and training institutions in Vietnam must review the program learning outcomes and the curriculum contents of the three existing degree programs to adjust and align them with EPHFs 2024 [6]. Priority should be given to adjusting the regular public health degree programs for the core public health workforce. Furthermore, universities can develop short-term courses for other relevant workforce groups that can provide public health services based on their functions and responsibilities.

AUTHOR CONTRIBUTIONS

NTH and HVM designed and conceptualized the paper. All authors prepared and reviewed the manuscript. All authors contributed to the article and approved the submitted version.

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The authors declare that they do not have any conflicts of interest.

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Implementation of the Community Component of the Mental Health Gap Action Programme (mhGAP): A Scoping Review

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Objectives: To identify implementation variables and justify the use of the community component of the Mental Health Gap Action Programme (mhGAP).

Method: The search was carried out in Cochrane, PubMed, Emerald, Scopus, Scielo, Redalyc and Google Scholar databases. Studies that analyzed the implementation of the community component of mhGAP were included, excluding those focused solely on the clinical component of mhGAP.

Results: Out of the 726 records initially identified, only four met the inclusion criteria. The findings reveal that the evaluation of the community component of mhGAP has primarily been conducted in conjunction with other global and community mental health strategies, as part of multimodal approaches. Factors are recognized as key barriers and facilitators for the successful implementation of the program.

Conclusion: The community component of mhGAP presents itself as a promising proposal to strengthen community-based mental health strategies. However, there is an urgent need to generate more evidence on the implementation of these strategies, particularly in terms of resource availability, long-term sustainability, and outcome monitoring.

Keywords: community mental health services, mental health recovery, community participation, implementation science, psychosocial support systems

INTRODUCTION

In the Americas, there are significant mental health gaps. The prevalence of mental disorders and substance use disorders, which account for 10.5% of the global disease burden, contrasts with an average treatment gap of 65.7%. In Latin America and the Caribbean, this figure reaches 74.7%, surpassing 50% in children and adolescents [1, 2].

The main causes of this gap include insufficient investment in mental health services, weaknesses in the implementation of community models, and an excessive reliance on costly and ineffective

Abbreviations: mhGAP, Health Gap Action Programme; PHC, Primary Healthcare; WHO, World Health Organization; GMH, Global Mental Health; PCC, Population, Concept and Context.

hospital systems. Additionally, the lack of trained personnel, the low availability of essential medications, and the absence of mental health integration into primary care exacerbate the problem. Individual barriers such as stigma, distrust in the healthcare system, and low mental health literacy also limit access to care and treatment [1, 2].

To address these gaps, it is essential to strengthen health system capacity by reinforcing community-based mental health models and strategies, while promoting culturally adapted care. Furthermore, it is necessary to foster community education on mental health to reduce stigma.

Community participation in mental healthcare is critical for addressing access barriers, advancing a rights-based approach, and promoting a comprehensive perspective in this field. The implementation of community-based mental health strategies necessitates a broader understanding of health beyond traditional healthcare, consistent with the core principles of global mental health. This field emphasizes equity and is enriched by contributions from diverse disciplines, including health services research and implementation science [1, 2]. In 2018, the Lancet Commission on Global Mental Health and Sustainable Development put forward four pillars to address persistent gaps that require attention [3]: Mental health as a public good, mental health conditions as a continuum, the relationship of mental disorders with social and environmental influences, and health as a human right. In low- and middle-income countries, where the gap in mental health is greater, the above has been validated with tools such as the WHO Mental Health Action Plan 2013–2030 [4] or by the Sustainable Development Goals instead of 2030 Health Agenda [5].

The persistence of poverty, food insecurity and gender violence, as well as humanitarian crises derived from conflicts and climate change, exert a strong influence on the mental health of communities [6]. The strengthening of global mental health is based on the precept of equity, which requires the adaptation of different strategies and approach models, depending on the characteristics and resources that has each region [7]. For this, the evaluation from a focus on determinants and social, political and structural determination of health allows for the prioritization of actions that highlight the role of the community in mental healthcare [8].

Primary Healthcare (PHC) is considered essential to facilitate the population's access to health promotion, disease prevention, care, treatment and rehabilitation services. In addition, it is recognized as a gateway to the health system and social care services, providing continuous and comprehensive care that addresses the health needs of people and communities [4].

Strategies proposed as essential to PHC include those that reduce costs and offer interventions to more people, in addition to strengthening community health and social medicine as theoretical foundations for contextualized care [9].

Similarly, decolonizing approaches to global mental health have gained momentum by proposing that interventions should be planned within local contexts to promote autonomy and agency in communities [10, 11].

In this regard, the World Health Organization (WHO) launched the Mental Health Gap Action Programme

(mhGAP) in 2008 [12]. The mhGAP consists of a training and support program for different audiences, such as community leaders, healthcare personnel, governments and decision makers, mainly aimed at low- and middle-income countries [4, 9, 12, 13]. This program focuses on the evaluation and treatment of people with mental and neurological disorders [4, 9, 12, 13].

While there are different mhGAP intervention guides—namely, the mhGAP Intervention Guide (mhGAP-IG), the mhGAP Community Toolkit, and the mhGAP Humanitarian Intervention Guide (mhGAP-HIG)—there is significantly more evidence supporting the use of the clinical intervention guide [mhGAP Intervention Guide (mhGAP-IG)] [4, 12–14]. The community component of mhGAP is understood as the “mhGAP Community Toolkit” and those strategies that, although part of mhGAP-IG, specifically target communities without developing clinical components at the community level. Although this component has been used and recommended due to its potential to address mental health gaps, evidence on the outcomes of its use remains limited [15].

The mhGAP Tools for Community Use are part of the WHO's Action Programme for Mental Health Gap (mhGAP), which aims for individuals with mental health disorders to receive high-quality, evidence-based mental health services, with a view to achieving universal health coverage. The purpose of these tools is to promote the expansion of mental health services beyond the primary healthcare setting. The mhGAP aims to enhance the participation of national and local authorities by allocating economic and professional resources to expand evidence-based mental health interventions.

In order to improve mental healthcare, the expansion of health services has been considered a central strategy that consists of four basic components: 1) primary healthcare services; 2) health education; 3) training of health workers; and 4) community management. These elements must be implemented alongside the strengthening of Primary Healthcare, seeking to combine efforts to ensure universal health coverage [16]. In this sense, the WHO's Action Programme for Mental Health Gap (mhGAP) is based on guidelines, instruments, and training methods supported by scientific data to expand services in countries, especially in resource-limited settings [5, 9, 12].

Specifically, from a policy perspective, efforts have been made to ensure the reorganization and expansion of mental health services and systems. In this context, there is a push to integrate the updated WHO Mental Health Action Plan 2013–2030, with the aim of implementing more integrated approaches aligned with reducing gaps in mental healthcare. This effort was reinforced by the Sustainable Development Goals instead of 2030 Health Agenda.

The Present Study

The mhGAP community toolkit was developed as a strategy aimed at promoting the expansion of mental health services that go beyond the primary healthcare setting. This objective is pursued through: 1. Identifying opportunities that exist within communities for mental health (prevention, promotion, and increasing access to mental health services); 2. Guiding the

identification of local mental health needs by leveraging available resources and opportunities, as well as roles within the local community; 3. Providing recommendations for the development of activities, programs, and community-level mental health interventions; 4. Combating stigma, discrimination, social exclusion, and human rights abuses that affect people with mental health disorders.

In this context, the community component of mhGAP has the potential to operationalize approaches like Global Mental Health (GMH), which seeks to balance available mental health resources and reduce care gaps. This approach effectively addresses various implementation challenges arising from the diverse conditions across countries and regions. Consequently, it serves as a response to these challenges from a community perspective, influencing the social determinants of health and providing a pathway to tackle the significant and persistent gaps in care in a more contextualized manner.

The implementation of action strategies has been another significant challenge, as translating theories into practice requires a complex process. Implementation sciences facilitate bridging the gap between intervention planning and actual application, especially in economically constrained environments [17]. Therefore, identifying the core components and important implementation variables of the community component of mhGAP provides a valuable foundation for designing, implementing, and evaluating the community component of mhGAP in diverse settings. Implementation sciences offer a comprehensive view of multi-level and interdisciplinary variables, emphasizing collaboration among research, policy, and implementation teams [17]. Thus, implementation sciences provide methodologies for the structured evaluation of these variables, allowing the synthesis of evidence regarding the use of the community component of mhGAP to yield an overview of common components in the processes already developed for its practical application.

However, despite a solid public health justification for the toolkit's implementation and recommendations for its application, development, and adaptation to different contexts, specific implementation aspects have not been detailed. This could hinder the development of the community component of mhGAP and lead to the persistence of the mental health treatment gap, preventing the optimization of resources needed to close it. Therefore, the aim of this review was to establish the justification for implementing the community mhGAP program and to identify the variables in the implementation process.

METHODS

The present scoping review is based on the methodological framework presented by Arksey and O'Malley [18], as well as the methodology manual published by the Joanna Briggs Institute for Scoping Reviews. Scoping reviews aim to rapidly map the key concepts underpinning an area of research and the main sources and types of evidence available, and can be undertaken as stand-alone projects in their own right, especially when an area is

complex or has not been thoroughly reviewed before [19]. Although mhGAP has been previously addressed in other reviews (particularly from its clinical component), the community component does not have a prior comprehensive analysis.

Inclusion, Exclusion and Sample Criteria

To carry out the scoping review, the Cochrane, Pubmed, Emerald, Scopus, Scielo and Redalyc databases were used, and gray literature searches were also carried out. The Boolean code was selected from Mesh descriptors and definitions widely accepted in the literature, specifically for the term "Community Mental Health AND mhGAP."

The research was carried out using the following keywords (Mesh and desc): [(Community Mental Health Centers OR Community Supports OR Community Resources OR Community Integration OR Community Health Services OR Community Networks OR Community Participation) AND mhGAP AND (implementation science OR implementation)], in the aforementioned databases. Additionally, manual searches of the reference lists of relevant articles were carried out to identify those that were not generated in the database search.

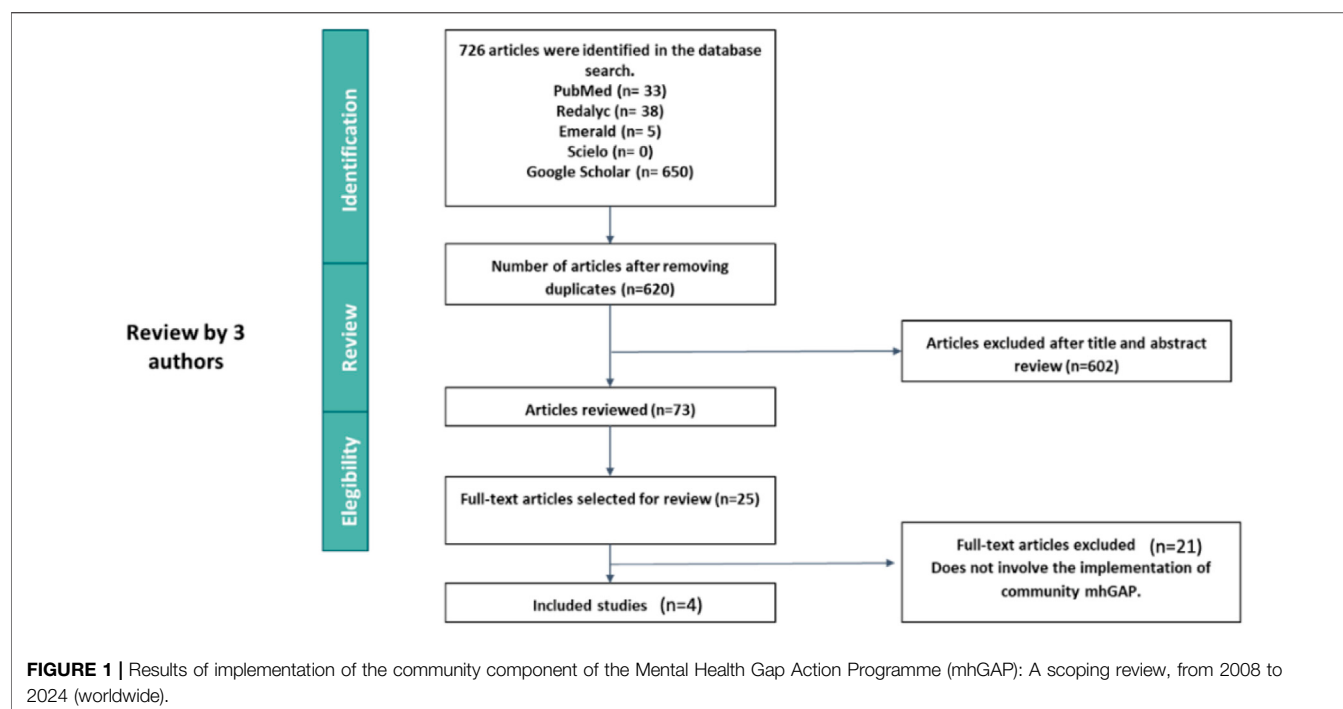
We conducted the search between 2008 and 2024, as mhGAP implementation began globally in 2008. The selected studies had to meet the following inclusion criteria: original studies, reviews or meta-analyses that report on the need to implement mhGAP, its development, especially in the community component. Studies describing only aspects of clinical mhGAP were not included. A total of 20 studies that only described the implementation of the clinical component of the mhGAP were excluded.

Study Protocol

The steps recommended by the Joanna Briggs Institute, in addition to those proposed by Arksey and O'Malley [18], were followed, using the PCC [Population, Concept and Context] strategy to formulate the review question. The PCC descriptors (Population, Concept, and Context) are used to structure the review questions in a Scoping Review. In this case, "P" refers to the Population, which includes the individuals or institutions that utilize or receive support within the framework of the community-based mhGAP. "C" represents the Concept, focused on the core components justifying the implementation of the community-based mhGAP and the implementation variables required for its effective application. The second "C" refers to the Context, which encompasses the community interventions of the mhGAP and the social conditions influencing the program's implementation. The use of these descriptors facilitated the formulation of clearer and more specific questions, thereby streamlining the analysis.

The review questions were: "What is the need to implement the community component of the mhGAP? What are the implementation variables or characteristics?" The question refers to the justification for implementing mhGAP, including the gaps for its implementation.

After performing the search, bibliographic citations were identified in the EndNote X9/2018 program, and duplicate studies were eliminated. For study selection, two researchers



initially reviewed the titles and abstracts according to the inclusion criteria. Verification of the eligibility criteria was carried out using a random sample of 25 articles. Using Cohen's K coefficient, agreement between observers was determined, which was 0.86 (95% CI: 0.66–1.00), considered good agreement.

The selection of studies was carried out by consensus of the panel of reviewers, in accordance with the critical appraisal tools, and those that passed the quality assessment were included in the review.

The Newcastle-Ottawa Scale [20] was used to assess the quality of non-randomized studies in this study. This tool evaluates three key dimensions: the selection of study groups, the comparability of the groups, and the determination of exposure or the outcome of interest. To ensure the quality of the included studies, compliance with the inclusion criteria was specified, which helped address the risk of bias and ensure the validity and relevance of the findings in this scoping review. They were considered of acceptable quality when the four evaluators agreed that 70% of the elements of the evaluation instruments were positive. Two reviewers with a doctorate in social sciences and a master's degree in community psychology evaluated titles and abstracts according to the inclusion and exclusion criteria. Following this, the full text was reviewed for eligibility.

All eligible articles were entered into Microsoft Excel, where the following information was extracted: publication type, study objectives, the community component of mhGAP background. There are also included: Community participation method, type of study, sample, mental health diagnoses, life course of the sample, results, description of the improvement indicator. Implementation variables include: acceptability, adoptability,

suitability, feasibility, fidelity, implementation cost, penetration and sustainability.

In addition, the method of Tricco et al. [20, 21] was used, with the following steps: 1) Identify the research question by clarifying and linking the purpose and research question, 2) identify relevant studies by balancing feasibility with breadth and comprehensiveness, 3) select studies using an iterative team approach to study selection and data extraction, 4) represent the data incorporating a numerical summary and qualitative thematic analysis, 5) collate, summarize, and report the results, including implications for policy, practice, or research, and 6) consultation exercise, where we considered public policy documents given the limited information on the community component. In this sense, data were organized and analyzed using a conventional content analysis approach, referencing research questions as a guide. Duplicate components or features were removed. If some search results fell into multiple categories, agreement was sought with the researchers.

RESULTS

Four articles met the inclusion criteria for the present Scoping review (Figure 1).

Of the four articles included, the majority correspond to studies carried out in low- and middle-income countries, with predominant narrative and cross-sectional review methodology as described in the table (Table 1). There are proposed as main categories: *The need to implement the community component of mhGAP and community component of the mhGAP implementation variables.*

TABLE 1 | Implementation of the community component of the Mental Health Gap Action Programme (mhGAP): A scoping review, from 2008 to 2024 (worldwide).

Authors	Country	Study design	Aim	Use of the component of the mhGAP
Agudelo-Hernández et al. [16]	Colombia	Quasi-experimental	Demonstrated that people at risk of suicide who participated in this component experienced a greater reduction in psychosocial disability, compared to those who only received psychiatric care or participated only in the clinical component of the program	Elements from the different mhGAP programs are included to evaluate implementation variables, barriers, and facilitators
Hamdani et al. [22]	Pakistan	Two-arm, single-blind, hybrid, effectiveness implementation, cluster randomized controlled trial	To evaluate the effectiveness and scale-up implementation of the locally adapted WHO PST program delivered by volunteer families in rural Pakistan	mhGAP was used as a concomitant strategy with PST in order to enhance treatment
Lasisi et al. [23]	Nigeria	Randomized controlled trial with intervention and waiting list control groups.	To evaluate the effect of ADHD training program on the knowledge and attitudes of primary school teachers in Kaduna, Nigeria	To evaluate the effect of ADHD training program on the knowledge and attitudes of primary school teachers in Kaduna, Nigeria
Faregh et al. [24]	The projects were carried out in multiple areas of six countries (Chad, Ethiopia, Nigeria, Guinea and Haiti)	Informal consultation approach to analyze the authors' combined field experience in the practice of mhGAP implementation and training	Explore key cultural and ethical dimensions of mhGAP planning, adaptation, training and implementation [1]. Concepts of wellbeing and illness: how to examine cultural norms, knowledge, values and attitudes in relation to "mhGAP culture" [2] Systems of care: identify formal and informal systems of care in the cultural context of practice [3] Ethical space: examine issues related to power dynamics, communication and decision making. Systematic consideration of these issues can guide the integration of cultural knowledge, structural competence, and ethics into implementation efforts	Proposal for cultural and contextual adaptations that can be applied when implementing mhGAP.

The authors.

The need to implement the community component of mhGAP.

comprehensive and contextualized approach for individuals at risk of suicide.

Recognition of the Importance of the Social Determinants of Mental Health

Among the results of this search, a Quasi-experimental study in Colombia that implemented the community component of mhGAP was identified, which demonstrated that people at risk of suicide who participated in this component experienced a greater reduction in psychosocial disability, compared to those who only received psychiatric care or participated only in the clinical component of the program [15]. There they found that many of the barriers to the adequate implementation of the strategies were related to the social, cultural and political conditions of the context such as stigma, the lack of solid support networks, geographical distances, armed conflict, administrative obstacles, among others. More broadly, the study found that the community-based mhGAP allows for the integration of community participation with healthcare to ensure a more

Community Education as a Bridge to Stigma Reduction

Hamdani et al. [22] developed an integrated service delivery model that fuses social, technological, and business innovations targeting children with developmental disorders and delays in low-resource contexts. In order to provide standardized care, a mobile application was designed that incorporates the WHO mhGAP-IG diagnostic and management guidelines, as well as the WHO Parent Skills Training (PST). Although this integration did not exclusively address the community component of the mhGAP, it did incorporate educational and clinical strategies in the parent and family training process, led by community actors. Also, in addition to evaluating the impact of the interventions in relation to the impact on stigma and understanding of psychiatric conditions.

Educational interventions have been an aspect highlighted in the literature based on the use of mhGAP. In a randomized controlled trial carried out by Lasisi et al. [23], the impact of a

training program on Attention Deficit Hyperactivity Disorder (ADHD) on the knowledge and attitudes of primary school teachers in Kaduna, Nigeria was evaluated. The educational strategy implemented was based on the ADHD component of the mhGAP. 85 teachers participated in the intervention group and 75 in the control group. After the intervention, there was a significant improvement in knowledge related to ADHD, a decrease in the negative perception of this diagnosis, and an increase in knowledge scores about behavioral interventions to address ADHD in the school setting.

Although the other two studies did not focus on evaluating the educational components of the tool, they do highlight the importance of the strategy as a clear and accessible training methodology that allows for adaptation to the needs of different communities.

Cultural and Contextual Adaptation of Interventions

Faregh et al. [24] presented systematic reflections and *post hoc* analyzes based on the authors' informal observations during their field experiences in mhGAP-related projects at various sites. Based on intensive field work experience, focused on capacity development, different challenges were identified. Among them were the cultural differences that impacted the ways of seeing and understanding mental disorders, the configuration of the local healthcare system, the level of prior knowledge and skills of the students, the sociopolitical context, among others. In order to address these problems, it is proposed to carry out processes of cultural and contextual adaptation of the different activities, promote the participation of the community and sectors involved, and the implementation of innovative and accompaniment processes that seek the continuity of the interventions.

In this context, they concluded that mental health training, although essential, does not automatically guarantee the desired results, so one must be open to new strategies and innovations that respect culture and context [24]. This requires the participation and commitment of various stakeholders, recognizing their ideas and needs.

Agudelo et al. emphasize that the implementation guide for the community component of mhGAP is determined by the functioning of the context. The various studies agree on the importance of assessing the conditions and the community in which the program will be implemented in order to identify the needs and resources of the environment and make use of them.

Implementation Variables

None of the included studies evaluated exclusive component of the mhGAP implementation variables. Only the study published by Agudelo-Hernández et al. [15] identified implementation variables themselves for different mhGAP modalities. In the other studies, although no implementation variables were identified, some common elements were recognized that were seen as important factors in the implementation of mhGAP, generally added to other types of clinical and community interventions. These factors were found to be presented

mainly as barriers to the implementation of comprehensive processes for addressing mental health in low-resource environments, and are also proposed as elements that could be mitigated to the extent that development conditions are improved in accordance with the needs and possibilities of the person. These elements are described in **Table 2**, and it is specified whether they are met in the included studies (**Table 2**).

For their part, Agudelo-Hernández et al. [15] focused their efforts on recognizing barriers and facilitators associated with the implementation of mhGAP at the clinical and community level associated with implementation variables. They conclude that the implementation of intersectoral recovery routes, built with and for the territory, must be approached as an integrative strategy that allows responding to diverse and dynamic challenges that affect the mental health and wellbeing of people and communities [16].

Regarding challenges, Hamdani et al. [22] identified that vulnerable health systems, lack of financing, and shortages of trained health personnel persist as significant barriers to the development, expansion, and sustainability of these interventions. When considering these obstacles from another perspective, they could constitute key elements for the implementation of public mental health strategies in low-resource settings. Stigma reduction can be taken as a factor that arises in relation to the implementation of mhGAP-based educational programs. This is because they allow for improving knowledge and attitudes in crucial contexts for the healthy development of daily life, mainly in relation to children when it comes to diagnoses such as ADHD [23].

Mutiso et al. [25] by addressing the gap in mental health treatment in Kenya in their study, led to proposing, with the community, elements that can allow better integration of mhGAP into community interventions. This is how they recognized as a key element the fact of placing the person and the community at the center from the autonomous exercise of their agency capacity.

The studies refer to factors that impact the implementation process of the strategy, such as availability and access, including the various resources required for its proper development; adaptation to the context and culture, assessing acceptability and usability; and a comprehensive, flexible training process focused on the community's needs and connected to the realities of the territory (**Table 2**).

DISCUSSION

In response to the need for consolidated strategies to reduce the mental health gap within a Primary Healthcare framework, this study aimed to establish the key aspects that justify the community component of the mhGAP and to identify elements of its implementation process. A scoping review was conducted rather than a systematic review for the purpose of identifying knowledge gaps, covering a body of literature to clarify concepts related to community-based mhGAP. These reviews can also be useful precursors to systematic reviews and can be used to confirm the relevance of inclusion criteria and potential questions [26]. In this case, the questions in the following review focus on features or concepts in papers or

TABLE 2 | Implementation variables highlighted in studies from the scoping review on the implementation of the community component of the Mental Health Gap Action Programme from 2008 to 2024 (worldwide).

Author	Availability of the strategy	Accessibility	Contextual adaptation and acceptability	Training, supervision	Monitoring, sustainability
Agudelo-Hernández et al. [16]	X	XX	XX	XX	XXX
Hamdani et al. [22]	X	X	X	XXX	XX
Lasisi et al. [23]	X	X	--	XXX	--
Faregh et al. [24]	X	XX	XXX	XX	XX

The authors.

studies, and mapping, reporting or discussing these features of the strategy for implementation.

Throughout the research, it was observed that there are no specific evaluations regarding the community mhGAP. Instead, the existing literature focuses on interventions that combine various mental health tools at the clinical and community levels [15, 22–25]. This finding highlights the scarcity of specific research on the implementation of the community mhGAP, although multimodal approaches have been identified as a key strategy for improving public mental health [15–17, 22–25].

Some articles that were not included in this review, although relevant, provide useful recommendations for the development of mhGAP strategies in community contexts. For example, Mutiso et al. [25], addressing the treatment gap in mental health in Kenya, propose focusing interventions on the person and the community, fostering their capacity for agency. Rebello et al. [27] suggest strategies to improve community mental health, such as integrating mental health services into primary care, sharing tasks from intersectoral approaches, and training non-specialized personnel. Additionally, they emphasize the use of technological tools as means to improve access to services and reduce costs. These interventions seek to reduce stigma and expand the capacity of mental health systems.

Patel et al. [3] also identifies key strategies to close the treatment gap, such as involving trained lay professionals and advocating for the participation of people with mental disorders in defending their rights. Wenceslau and Ortega [28], in their theoretical analysis on the integration of mental health within primary care, propose the need to optimize resources in low-income regions where specialized care is not continuous. This approach aligns with the implementation variables identified in this study, which underline the importance of adapting mental health interventions to the local context and optimizing available resources.

In relation to strategies aimed at communities, training in clinical mhGAP has also proven crucial to closing gaps in availability and quality of care [29]. Keynejad et al. [30] conducted a systematic review to identify the evidence generated from its implementation. Preventive measures adopted by the community are highlighted as elements of great value, as well as ongoing community support linked to clinical follow-up [31].

Just as in the community component of the mhGAP addressed in this review, Keynejad et al. [30] identify significant implementation gaps at the clinical level and conclude that it is necessary to integrate primary care approaches with

community care. Other proposals have pointed out the need for ongoing contact between health professionals and individuals, in addition to involving the family, community, and cultural sphere [30].

A strength of the community mhGAP is its ability to overcome approaches that promote homogenization in the understanding and management of mental health. Contextualization and cultural adaptation of interventions are fundamental for their effective implementation [4, 13]. Clinical implementation studies of the mhGAP have also concluded that it is necessary to adapt its application to the specific context in which it is intended to be used [16], as such adaptation is essential to ensure the relevance, acceptance, and continuity of interventions [32].

Cultural and contextual adaptation, meaningful community participation, and continuous follow-up are crucial for the acceptability, effectiveness, and sustainability of the program [17, 27]. The implementation of the mhGAP should provide a clear framework for integrating culture and addressing the needs of the population [17]. Approaches that integrate cultural adaptation, community participation, and ongoing support are proposed as the most effective for addressing mental health in primary care in low- and middle-income settings. Although evidence on the community mhGAP is still limited, these findings highlight the urgency of developing implementation strategies that are culturally relevant and sustainable, ensuring that mental health interventions adequately respond to the needs of the populations they target.

The four analyzed articles emphasize the importance of prioritizing the local customs and practices of the group being intervened. They recommend providing more concrete information about the roles of each involved actor, ensuring that everyone understands their responsibilities in the process. Furthermore, they highlight the need to train various actors in the different components of mhGAP, stressing that professionals should act as human beings rather than merely as health resources. This approach aims for each actor to have a clear understanding of what mhGAP entails in their community and how they can effectively apply it in their specific context.

No studies were found that applied specific implementation science frameworks in the context of mhGAP, nor were there any that demonstrated a clear approach from this perspective. Implementation science is essential for translating scientific evidence into effective health practices that adapt to local characteristics.

This would allow for a more precise evaluation of interventions, facilitating the identification of barriers and facilitators in their

adoption, and offering concrete recommendations to improve their impact. However, its application in mhGAP and other mental health strategies remains limited, particularly in resource-constrained regions, underscoring the urgent need for further studies to address these gaps.

It has been noted that the implementation of mhGAP tends to follow a biomedical approach that does not adequately consider local needs and contexts. Many of the interventions associated with mhGAP have been developed in Europe and North America, raising questions about their effectiveness in other settings. Therefore, contextualization and cultural adaptation are essential elements to ensure that interventions are relevant and effective across diverse communities [16, 21, 33].

This review highlights the limited evidence supporting the use of specific community mhGAP tools. Nevertheless, it emphasizes the importance of integrating multimodal approaches that do not separate from clinical strategies and intersectoral interventions, aligning with mhGAP principles.

The implementation of the community component of mhGAP in countries with gaps in care is crucial to engage communities in a comprehensive approach to mental health. It helps reduce stigma, strengthens mental health governance, and fosters collaboration between health systems, communities, and other sectors. Moreover, it allows addressing barriers to treatment access and enhances culturally sensitive psychosocial recovery strategies.

Limitations

Among the limitations of this study, it is acknowledged that the articles included primarily focused on the community component of mhGAP. This focus may have led to the exclusion of other relevant articles concerning the community component of mhGAP and other components recommended by the WHO. Specific mentions of community mhGAP were scarce, except for the study by Agudelo-Hernández et al. [16]. This underscores the need to broaden the search in grey literature, particularly for reports from health organizations that are implementing this component.

While the articles were carefully analyzed to ensure that those including any community component of the mhGAP were not excluded (according to the operational definition), it remains a limitation that some reviewed studies primarily focused on the clinical aspect of the mhGAP. These studies may have contained relevant components for the review's objectives. Despite refining the search strategy and reviewing it with multiple researchers, it is possible that some terms were overlooked or not entirely precise.

The above highlights the need to continue strengthening knowledge management and the dissemination of demonstrative experiences in the local implementation of the practices proposed in the global policy. Although it was not possible to define the core components or the methodologies to be included in the study according to the criteria, it was found that countries such as Colombia [34], Paraguay [35], Argentina [36], and Costa Rica [37] are implementing this strategy.

The creation of repositories and records of good practices in the development of the mhGAP program is proposed, aiming to have clear information about the development process and its results. This can facilitate the systematization of experiences in

public policies, both from the perspective of implementers and actors in the health system and the community.

It is essential to integrate research findings in the field of community mental health, ensuring that evidence is accessible and usable to inform the generation of effective policies and practices. Doing so strengthens the responsiveness of health systems to current challenges, thereby improving the quality and scope of services offered and making transversal approaches to recovery effective.

Additionally, it is crucial to consider the barriers and facilitators in the implementation process. The effective development of mental health initiatives often necessitates significant social, economic, and sometimes political changes, which are challenging to achieve without political will and sufficient resources. Future research should explore these aspects of community mhGAP, particularly through technical reports from various countries, and consider longitudinal studies to define implementation variables and assess their impact on individuals and health systems.

The study's potential biases include the omission of relevant articles due to the selection of databases and search terms used. Additionally, the exclusion of studies focusing solely on the clinical component of mhGAP may have limited the information gathered, as some of these studies might contain valuable contextual insights. The lack of geographical diversity also represents a bias, as the included studies mainly originate from Western contexts, potentially excluding relevant studies from other regions.

Among the limitations of this study, the lack of exhaustive analysis on the scalability and cultural adaptation of mhGAP stands out. These aspects may present challenges for its implementation in low-resource settings. Future research should address these barriers to improve the applicability and effectiveness of the program.

In conclusion, the review of the evidence regarding the community component of mhGAP reveals a significant lack of information about its implementation. Nonetheless, it highlights its potential to promote a more contextualized approach that addresses local needs and resources, particularly in low- and middle-income countries.

To enhance the effectiveness of interventions, it is crucial to consider the specific realities and capacities of each community. Factors such as accessibility to services, cultural adaptation of interventions, ongoing training for personnel, and the accompaniment and follow-up of initiatives are essential for developing sustainable and effective mental health programs.

These findings underscore the urgent need to intensify research on the outcomes of mhGAP community strategies. Through rigorous evaluations and contextual adaptations, it will be possible to identify best practices that can make these interventions more relevant and effective in diverse settings.

AUTHOR CONTRIBUTIONS

The authors declare that they have participated in the preparation of the manuscript and have contributed to the activities detailed below: FA-H: conceptualization, data collection, data analysis,

writing (writing the original manuscript), methodological design, writing (review), supervision. AG-Á: conceptualization, writing (writing the original manuscript), methodological design, writing (review), supervision. All authors contributed to the article and approved the submitted version.

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CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

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Exploring the Needs of Stakeholders For Successful Patient Involvement in Mental Health Education

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Objective: This scoping review aims to comprehensively map the existing literature on Patient Involvement (PI) in mental health education (MHE), identify the needs of mental health (MH) educators, students, and patients with lived experiences of MH challenges and develop a checklist for successful implementation of PI in MHE.

Methods: Conducted between November 2023–January 2024, this review followed PRISMA-ScR guidelines in databases PubMed, Scopus, ProQuest Dissertations and Theses, and WHO. Eligibility criteria adhered to PICOS guidelines, and screening was done via Covidence. Content analysis was carried out to develop a checklist.

Results: Eleven qualitative articles were found, revealing two superordinate stakeholder needs categories: Interpersonal and Course Needs. Interpersonal Needs included Self-determination, Communication and Collaboration, Recognition and Support, and Holistic approach. Course Needs comprised Content, Organisational, and Teaching. A checklist was developed to support PI in MHE.

Conclusion: Guidelines for successful PI in MHE should prioritize patient autonomy, foster collaboration, provide support, ensure inclusive course content, and promote patient involvement in educational processes. Study limitations, such as potential bias, underscore the need for future research to enhance evidence-based practices in MHE.

Keywords: patient involvement, mental health education, scoping reviews, checklist, content analysis

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INTRODUCTION

Mental health education (MHE) is evolving to integrate the perspectives of individuals with firsthand mental health service (MHS) experience. This signifies a shift from a traditional passive role towards an active involvement of patients in students' clinical education. In consonance with the findings of Simmons et al. and Costa et al. about individuals receiving mental health treatment, the word patient is used consistently throughout this review report and when an original article occupies a different name to indicate patients [1, 2]. This approach of Patient Involvement (PI) in MHE views mental health patients as *experts by experience*, (EBE) who contribute positively to students' and EBE's attitudes and wellbeing [3–5]. PI has historically received more attention in physical health education than in MHE [6]. In clinical and communication skills teaching, PI began in the late 1970s with role-play patients, evolving into symptomatic PI programs by the 1980s by Stillman to enhance medical student examination

[7]. PI disappeared from clinical education but resurged with the shift to the biopsychosocial model, emphasising patient expertise and collaboration [8, 9].

According to the prevailing model of PI of Towle and colleagues, three guiding principles shape patient inclusion in teaching [9]. First, the knowledge patients possess by experience cannot be generated by faculty. Second, for authentic inclusion of patients, power relations should be balanced. Third, patients should have a say in how and what to teach. Towle et al. also propose a hierarchical structure or taxonomy of PI [9]. The taxonomy ranges from 1 (low participation) to 6 (high participation): wherein 1) the patient is studied as a case; 2) the patient volunteers in clinical tutorials; 3) the patient shares experiences within a pre-established module framework; 4) the patient is actively teaching and evaluating students; 5) the patient contributes to curriculum development; 6) the patient has sustainable membership within the educational institute. When patients do take an active role within the curriculum of MHE, patients mostly take on the role of teacher, taking up a lower-to-intermediate-level of involvement [10].

From the health professionals' perspective, barriers to more active PI in MHE include the view that patients may not be fit for collaboration in decision-making (often in the case of severe mental illness), a lack of conceptual clarity of PI, increasing demands on health professionals' time, and the biomedical model's tendency to focus on patient's limitations rather than strengths [11]. Despite these perceived barriers, professionals from multiple MH fields are increasingly willing to involve PI in MHE programmes [4].

PI in healthcare education has different meanings depending on the stakeholder's perspective. For this reason, an assessment of the benefits and shortcomings of PI within healthcare education is lacking [11]. This knowledge gap leaves MHE curriculum developers lacking predefined guidelines for implementing PI and, with this, limiting the potentially positive effects of PI by minimising its implementation in educational programmes [4, 11]. This also reflects the lack of consensus of the definition of PI in MHE [12].

While policymakers and MHS administrators may also have important roles to play in PI implementation, stakeholders such as students, educators, and patients are directly involved in the MHE process and have a profound impact on its outcomes. Identifying their needs is crucial for tailoring educational approaches to address specific challenges or enhance positive aspects of PI in MHE [13]. This information is needed to lay the groundwork for developing an evidence-based fundament for PI implementation within MHE and identify areas where understanding and utilising PI is still underexplored. This fundament can be used by curriculum developers, educators and policymakers to establish guidelines for successful PI implementation in MHE programmes. In short, this study aims to a) comprehensively map the existing literature on PI in MHE, b) systematically analyse and identify the needs of the three main stakeholders of PI in MHE, and c) develop a checklist based on these identified needs.

The following review question has been formulated using the PICOS framework to reach the previously mentioned benefits of conducting a scoping review [14].

"What are the needs of students, mental health professionals and patients in PI in MHE?."

METHODS

Scoping review was selected as the method due to the broad scope of the research topic and to highlight gaps in the existing literature to encourage future research in this dynamic and growing interdisciplinary field [15]. The scoping review protocol was based on established guidelines ([16], further refined by 15) and adheres to the PRISMA Extension for Scoping Reviews (PRISMA-ScR) [17]. This methodological framework and the prescribed reporting guideline aim to heighten the scoping review process's replicability, and overall quality.

The literature research for this scoping review was conducted from November 2023 to January 2024. For this literature review, PubMed/MEDLINE, Scopus, ProQuest Dissertations and Theses, and World Health Organization databases were systematically searched to ensure a comprehensive perspective on the literature. Both grey literature and peer-reviewed sources were explored to enhance data comprehensiveness, capturing a broader spectrum of specific PI-related experiences. This provides a more holistic view of PI, which aligns with the study's goals [18]. The ProQuest Dissertations and Theses and World Health Organization search engines were used to identify literature sources not findable in scientific databases for this purpose.

The eligibility criteria in **Table 1** were used to screen articles included in this scoping review. The screening process consisted of 2 phases: 1) title and abstract screening and 2) full-text screening, both undertaken by MK in consultation with YN. Criteria refinement was an iterative process informed by preliminary literature searches, with ongoing adjustments based on ambiguities during screening. Both review phases were conducted using the Covidence screening software [19]. A standardised data extraction form based on the PRISMA-ScR guidelines was used to capture the concepts of interest within each article [20]. Reference snowballing, using both forward and backward searches, was employed to extend the database searches.

A pilot literature search by MK in PubMed established the initial keywords which were refined by YN. The search strategy (**Table 2**) included general search terms and specific search strings tailored for each database. PI in MHE encompasses various terms used for similar concepts, such as "patient involvement," "consumer involvement," and "service user involvement," among others. Similarly, MHE spans diverse domains including clinical psychology, therapist training, and psychiatric nursing education. By formulating a search string that incorporates these terms and their synonyms, inclusivity and breadth is achieved. There were no predetermined restrictions on the studies' publication date and geographic location, ensuring a thorough exploration of historical and contemporary literature.

TABLE 1 | Eligibility criteria (Exploring the Needs of Stakeholders for Successful Patient Involvement in Mental Health Education, Netherlands, 2024).

Aspect	Inclusion criteria	Exclusion criteria
Population	Students, educators and patients who uptake an active role in MHE	Patients are not actively involved in education (level 1 or 2 in Towle et al. [9]’s taxonomy)
Context and scope	PI in MHE is addressed	General healthcare education or pharmacy education
Outcomes	Focus on the needs of stakeholders concerning PI: exploration of practical implications and experiences of PI in MHE	No mention of implicit or explicit needs of students, patients or educators
Types of Evidence	Qualitative and quantitative studies, mixed-methods research, systematic reviews, grey literature, dissertations, conference abstracts/proceedings, case studies, study protocols, and professional organization reports	None

TABLE 2 | Search string (Exploring the Needs of Stakeholders for Successful Patient Involvement in Mental Health Education, Netherlands, 2024).

Key words and boolean operators

("patient involvement" OR "consumer involvement" OR "service user involvement" OR "expert* by experience" OR "lived experience" OR "mental health patient*" OR "mental health service user*" OR "mental health survivor*" OR "mental health consumer*" OR "psychiatric survivor*" OR "client involvement" OR "patient engagement" OR "EBE") AND ("mental health education" OR "clinical psychology program*" OR "clinical psychology training" OR "clinical psychology curriculum" OR "psychology education" OR "psychology training" OR "psychology program*" OR "psychology curricul*" OR "psychology learning" OR "psychology teaching" OR "psychology student* perspective*" OR "therapist training" OR "therapist education" OR "therapist program*" OR "therapist curricul*" OR "Mental Health Training" OR "Psychology Education" OR "Mental Health Counseling" OR "Psychiatric Nursing Education" OR "Mental Health Professional Training" OR "Therapist Education" OR "Counseling Psychology Training" OR "Psychotherapy Training" OR "Community Mental Health Training" OR "Recovery-Oriented Training" OR "Mental Health Worker Training") AND ("need*" OR "requirement*" OR "expectation*" OR "desire*" OR "necessit*")

The study selection process is depicted in **Figure 1**, in which the number of excluded articles per step and the reason for exclusion are mentioned. The remaining articles were imported into the online study screening software Covidence [19].

The data charting form was developed within Covidence. Here, the study goal, the specific stakeholder that the article focuses on, the level of patient involvement (according to the model of Towle et al. [9]) and the identified needs for successful PI in MHE by the stakeholder education, were extracted from the articles. These categories were chosen to facilitate the comparison of data relevant for answering the research question. Data were gathered by reading the methods, results, and discussion sections of the 11 selected studies. The data extraction table is displayed in **Table 3**.

To analyse the data, content analysis was employed to identify patterns and themes, as well as systematically categorise and synthesise the data [31]. Content analysis is particularly suitable for the exploratory nature of a scoping review, providing a foundational understanding of the topic, accommodating and conceptually mapping the diverse data available in the included studies [32]. The coding process, conducted in ATLAS.ti 23.4.0 for Windows, involved iterative refinement as more data were analysed. A trustworthiness checklist was followed to ensure analytical rigour [33].

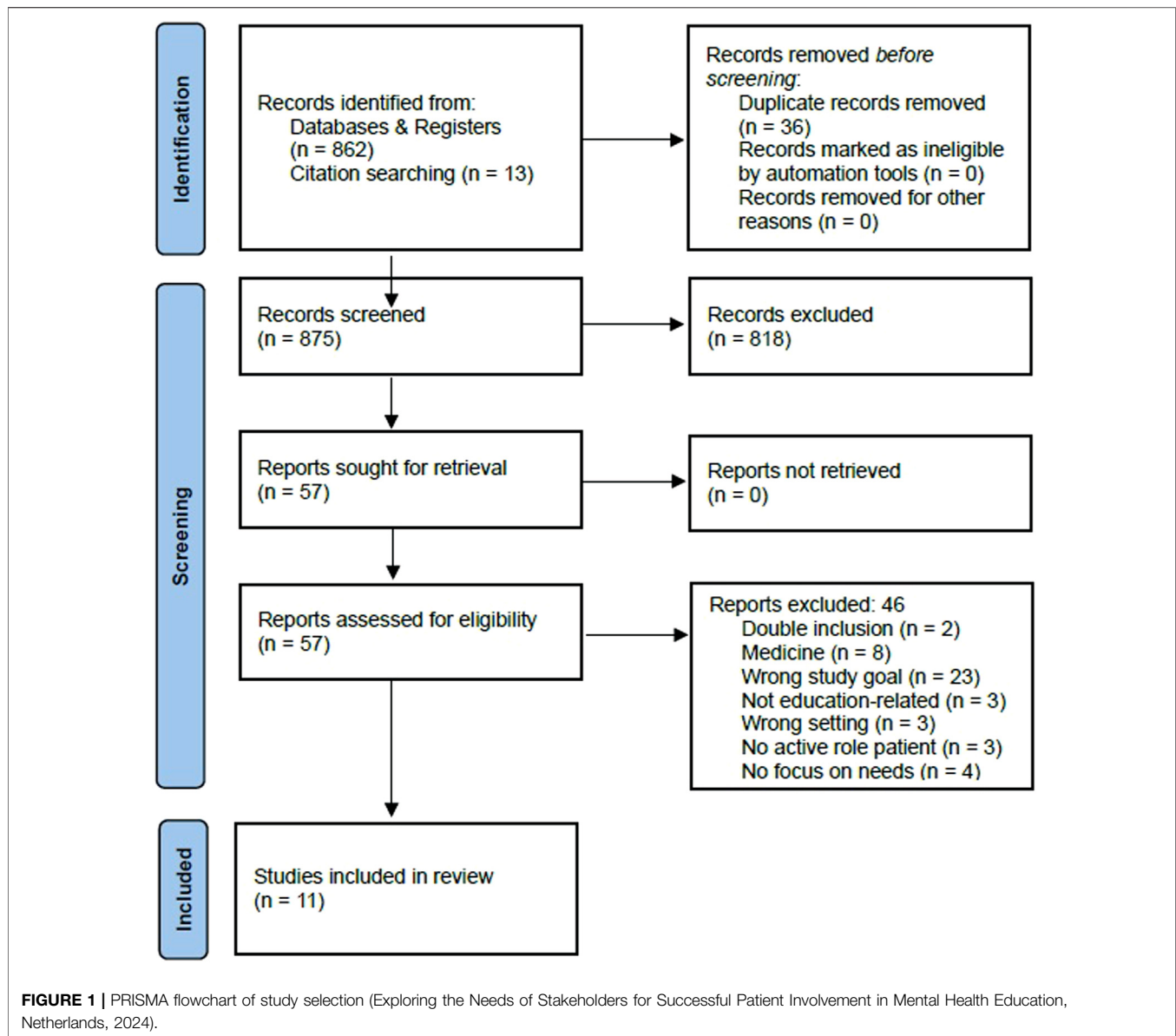
Data analysis was conducted inductively to identify essential concepts and facilitate analysis and mapping [34]. In the preparation phase, the results sections of the 11 selected articles underwent probability sampling due to the large volume of text with low relevance to the analysis theme [34]. In the organisation phase, the coding process started with open coding to create categories and abstract the data. Then, axial

coding was used to group similar concepts into new themes. Finally, selective coding was used to adjust and finalise the coding scheme, forming a general description of the main contents within the articles [35]. The analysis aimed to achieve thematic saturation, with further analysis unlikely to yield substantial new information or significantly alter identified content themes [36]. Coding guidelines were established to extract different stakeholders’ (patients, educators and students) implicit and explicit needs from the articles, enhancing research transparency and trustworthiness, as well as facilitating systematic data exploration (**Table 4**).

Based on the results of the content analysis, a checklist was developed by YN and refined by EdB. An evidence-based checklist development approach was used, and refinement followed an expert-based approach [33, 38]. First the frequency of the codes was reviewed, then the themes and subthemes were re-interpreted based on the relevance to MHE.

RESULTS

The inductive content analysis revealed two superordinate themes related to the needs of stakeholders concerning PI in MHE: interpersonal needs and course needs (see **Table 5**). The needs of patients, educators and students are presented holistically since many themes have relationships with two or all stakeholders in slightly different ways, although reporting the nature of the relationships was beyond the scope of our interpretive strategy. Most themes highlight the needs of patients since most research on PI in MHE is conducted on patients.



Interpersonal Needs

The superordinate theme of *Interpersonal Needs* in the context of PI in MHE encompasses the interpersonal dynamics between patients, educators, and the broader educational system.

The subordinate category of *Self-Determination* depicts the need for autonomy, highlighting the importance of control within the educational contributions of patients. This autonomy extends to decisions regarding the content they share, how they share it, and the impact they hope to make [21, 22, 25, 28]. A quote from a patient from the research of Campbell et al. illustrates this: “I’m waiting to see, that as I say our good faith in terms of how we’re involved and how we’re contributing is recognised.” (p. 343). Patients seek influence in decision-making as well as feelings of empowerment after their involvement in the educational process, desiring a sense of capability and influence. Empowerment enables them to

actively contribute to the educational process and contribute to a positive impact on MHE [25].

Another subordinate category of *Interpersonal Needs* is *Communication and Collaboration* between patients and educators (and MHE institutions). Clear communication of shared goals and vision for MHE is often seen as crucial by all stakeholders. This is underscored multiple times by patients’ desire to be seen as equal to educators within the educational process [21, 27, 28]. This equality involves ensuring that patients’ voices, perspectives, and lessons are treated equally to those of educators and MH professionals, which students also acknowledge as necessary. As a student pointed out in Lea et al. [28], “A more equal relationship, not them thinking they are above you” (p. 6). This requires a dialogue that values the input of both parties, and entails acknowledging patients’ expertise and recognising that effective collaboration relies on

TABLE 3 | Data extraction table (Exploring the Needs of Stakeholders for Successful Patient Involvement in Mental Health Education, Netherlands, 2024).

Study ID	Participant Info	Study objective	Stake-holder	Level of PI	Needs of investigated stakeholder(s)
Campbell and Wilson [21]	5 patients selected for participation Professional educators with >15 years of mental health service experience Ireland	To explore the experiences of service users participating in a clinical psychology training course. The aim was to address limitations identified in previous research and supplement existing knowledge by employing IPA to understand the psychological processes involved in such initiatives	Patients	2,3,4	To be acknowledged as colleagues rather than subjects of study Educators and students value lived experiences over academic knowledge in contributing to the training of MH professionals Having power and influence Use of forum to express needs and views in a respectful atmosphere Transformation, both of self and the MH systems
Clarke et al. [22]	10 randomly selected educators United Kingdom	Review benefits and barriers to PI	Educators	Various active levels	Genuine and integral involvement rather than tokenistic approaches Importance of strategic involvement at the management level for effective change Integration of PI with other aspects of course Equality between stakeholders; colleague educators are open to new experiences Enough personal, financial resources and less bureaucracy in Universities.
Happell et al. [23]	Educator group (n = 34) Patient group (n = 12) Australia	Present the perspectives and experiences of nurse academics and consumer educators regarding the feasibility and support for consumer participation roles in education for MH nursing	Educators and patients	Various active levels to ensure diversity	Enhance accessibility of course for individuals outside the MH field Reliability Need for organised and reliable patients Equality to general educational staff Vulnerability Recognise the burden on consumer and wellbeing issues and reduce tokenistic approach Patients that can handle vulnerability Support Systemic support and structured emotional support Seen as Gripping Positive orientations are needed to gain a broader view Realistic and positive patients but not only those with ideas corresponding with views of academics More incorporated EBE-led sessions to enhance understanding of mental distress. Correct planning within schedule to maximise benefits of the programme Greater consistency between patient content and assessments More structure within the course programme
Happell et al. [24]	51 students, 43 female, 8 male Finland, Australia, Ireland, Iceland, Netherlands, Norway	To gather and present student feedback regarding their experiences with Experts by Experience (EBE) in the context of mental health education	Students	3,4	Include multiple perspectives. More balanced presentation of positive and negative experiences from patients

(Continued on following page)

TABLE 3 | (Continued) Data extraction table (Exploring the Needs of Stakeholders for Successful Patient Involvement in Mental Health Education, Netherlands, 2024).

Study ID	Participant Info	Study objective	Stake-holder	Level of PI	Needs of investigated stakeholder(s)
Happell et al. [25]	14 patients Finland, Australia, Ireland, Iceland, Netherlands, Norway	To examine the experience of being an EBE from the perspective of EBEs involved in the design, development and delivery of an EBE-led mental health nursing module	Patients	4,5	Collaboration with and support from nursing educators Autonomy in presenting patient perspective and presenting views inconsistent with those of academics. Emotional and practical support by formal and informal support mechanisms, team meetings, help in navigating (digital) systems and open-door policies Establish and maintain boundaries in sharing personal stories. Be able to consider purpose of the narrative and be selective about the details shared Adapt to needs of individual students at different educational stages
Horgan et al. [37]	50 patients participating in focus groups Iceland, Ireland, Finland, Netherlands, Norway and Australia	To develop a learning module based on service users' perspectives, experiences and opinions about service user involvement in mental health nursing education	Patients	Involved in teaching (n = 3) not further defined	Support; including external supervision, teamwork, and debriefing. Support for students who find working with patients distressing Facilitate emotional, communicational and personal developments of students by course. Practical content to aid holistic understanding of mental illness More than one patient involved in teaching: diverse range of experiences. Stories that balance positive and negative aspects of experience Longer periods of involvement spread over the years for deeper engagement and reflection
Kang et al. [26]	98 psychiatry students at Semyung university, South Korea	To understand the impact of consumer involvement on nursing students' attitudes towards mental health, their reflections on life, the learning experiences gained, and the preparation it provides for their future nursing careers	Students	3	Relating to lived experience to integrate theoretical knowledge and apply it More sessions with multiple patients, extended sessions and group discussions to improve own understanding More info about hospitalised consumers, more focus on nursing education and interaction with clinical experts in practice also to be integrated into the course
Kerry and Collett [27]	patient group of 10 + Group of 19 first-year trainee clinical psychologists in doctorate programme completing a survey United Kingdom	To examine the level and impact of EbE involvement in teaching on a UK DClinPsych course. It sought to gather information to generate change ideas and recommendations for EbE involvement in teaching	Patients and students	3, 4	Patients Further training in teaching and utilising online platforms Emotional support in boundary-keeping and handling distressing challenges to feeling empowered in teaching Bring about changes in themselves, students and future clients. Bringing purpose to lived experiences. Students Relating to intimidating lived experiences to gain confidence More informal contact with patients, and opportunities to ask questions Balance of positive and negative presented experiences, hearing different views Early exposure to emotional content to optimise skills and knowledge Emotional support for distressing patient content. Time to reflect on presented experiences Hearing wide range of perspectives, more diversity in the patient population and presented experience

(Continued on following page)

TABLE 3 | (Continued) Data extraction table (Exploring the Needs of Stakeholders for Successful Patient Involvement in Mental Health Education, Netherlands, 2024).

Study ID	Participant Info	Study objective	Stake-holder	Level of PI	Needs of investigated stakeholder(s)
Lea et al. [28]	Focus group of 8 patients (4 men, 4 women) 5 clinical psychology trainees (4 women, 1 man) 5 members of course staff (5 women) United Kingdom	To elicit service users', students' and staff's perceptions of the objectives and potential outcomes of service user involvement in clinical psychology training, in order to inform future questionnaire development	Patients, Educators, Students	3	Stay human through emotional intelligence development in educating students to ensure respectful future practice with cultural sensitivity Compassion for lived experience and emotional understanding, valuing lived experience more than academic knowledge Safe spaces to learn, learn from dealing with emotional experience and relating to it Learn how to instil meaning in life and self-determination; holistic approach (positive psychology approach). Reduction of the "them-us" divide Active role for patients in selection of the right patient for involvement Avoiding use of jargon
Meehan and Glover [29]	95 patients (mean age = 47.2, 54% women) involved in teaching in the London medical school psychiatry course	Explore the experiences of former MH consumers who have participated in the education and training of MH staff and students	Patients	4	Prevention from feeling exposed by presenting lived experience; not being asked inappropriate questions or seen as practice doll for diagnosing Educators needs to value contribution of patients; prevention of tokenistic approach Patients want to know what is expected from them in educational programmes
Walters et al. [30]	20 patients 12 educators 14 students All demographical diverse United Kingdom	To evaluate the impact of patient involvement in undergraduate medical education, specifically in the context of teaching medical students in community settings, with a focus on patients with common mental disorders	Patients, Educators, Students	3	Students show sympathy for patient Patients need distress relief by debriefing and prevention of intrusive questions by students and educators Patients need solid boundaries to decrease the experienced increased obligation

TABLE 4 | Guidelines for extracting needs from articles (Exploring the Needs of Stakeholders for Successful Patient Involvement in Mental Health Education, Netherlands, 2024).

Type of expressed need	Description of need	Example
Explicit Needs	Direct statements expressing needs. These are often straightforward and leave little room for interpretation	"A more equal relationship, not them thinking they are above you" [28]
Implicit Needs	Implicit needs may be implied or hinted at in the text. You may need to read between the lines to infer the needs of participants	"I'm waiting to see, that as I say our good faith in terms of how we're involved and how we're contributing is recognised." [21].
Descriptive Language	Indicates dissatisfaction or gaps, as these may point to underlying needs	"I think if there was too much kind of input or steering me in one direction that's not giving authentic service user view" [25]
Expressed Preferences	Preferences indicate needs	"to learn more about the whole person, rather than the ill person they see in hospital or here in the services" [37]
Problem Statements	Problem statements point to opposing needs	"In one case this experience was attributed to a lack of sympathy of the student" [30]
Calls for Improvement	Indications for improvements or changes in existing programmes indicate unmet needs	"There could be more opportunity on placement for learning about service user perspectives and working with self-help/community groups" [22]

reciprocal exchange of trust and understanding [22]. Also, fostering positive relationships between patients, educators, and MH professionals is emphasised. Building trust and rapport creates a conducive environment for effective collaboration, enabling sharing of experiences and knowledge in a respectful environment [21, 23, 24, 30].

A third subordinate category of *Interpersonal Needs* is *Recognition and Support* for PI in MHE, which relates to an often-perceived lack of support for all stakeholders within the educational field. Lived experiences presented by patients may be distressing for all stakeholders, emphasising a need for emotional support opportunities [23, 25, 27, 28, 37]. A proposed way of providing emotional support was to have more time after educational sessions for patients to talk about the lesson and to support each other, as pointed out by students in the research of Horgan [37]. Intellectual support complements this by fostering the intellectual growth of all stakeholders through the lessons taught by patients, ensuring that their contributions are both emotionally validated and intellectually stimulating. Practical support includes assistance in navigating the practical aspects of the course, such as educational systems and software [37]. Stakeholders express a desire for positive feedback and affirmation, depicting the need for explicit recognition of patients' efforts by both students and educators [21, 27]. Patients' need for authentic connections with students and educators underscores the importance of valuing personal backgrounds in patient education, fostering empathy and understanding among learners and educators [22, 26–28]. The reduction of us-them thinking centres on breaking down binary distinctions and fostering a sense of shared identity and collaboration. In the context of patient educators, this means dismantling perceived divisions between educators, learners, and individuals with lived experiences [22, 28]. An example of this is the perspective of a patient pointed out by Clarke and Holtum [22]: "It helps develop a different mindset for the trainee (student) - experiencing the other differently but not 'othering'." (p. 5).

The final subordinate category of *Interpersonal Needs* is *Holistic Approach*, which includes acknowledging patients as multifaceted individuals, recognising the interconnectedness of

their lives beyond MH issues [26–28, 37]. The purposeful consideration of personal stories involves recognising the power of narrative in MHE [22, 25, 27, 28, 30]. In the research by Lea et al. and Meehan et al., there is a recurrent theme of needs, emphasizing a positive psychology viewpoint [28, 29]. This viewpoint underscores strengths, resilience, and wellbeing, and thus departs from deficit-focused approaches to one that highlights the strengths of patients in PI in MHE.

Course Needs

The superordinate *Course Needs* theme encompasses a commitment to providing a comprehensive, relevant, and empathetic educational experience for students, educators, and patients. The subordinate theme *Content* addresses requirements for MHE content, including relevance, balancing positive and negative experiences, authentic storytelling, and therapeutic approaches. When during teaching patients share both successful treatment elements and negative experiences, this can positively impact MHE [22–25, 27, 37]. The quotes of a patient and a student in the research of Kerry et al. illustrate this vividly [27]. Patient: "I hoped that, by discussing good and bad experiences, we could influence future outcomes for clients in a similar position to us." Student: "I also found it helpful to hear some of their more negative experiences of services, as I have tried to bear those in mind and avoid similar practice on placement." (p.4). Also, students emphasize the importance of diversity (various life experiences, cultural backgrounds, and cognitive perspectives beyond the neurotypical) in the patient population and lived experiences [22–24, 27]. An example of this is pointed out by a student in Kerry et al.'s research: "it would have been substantially helpful to hear from individuals with lived experience who may not quite fit specific diagnostic criteria, or who may have had alternative reflections on diagnoses." (p.7) [27]. Furthermore, stakeholders stressed the need for expanded course content and increased integration of patient-led lessons into the curriculum, alongside mandatory PI courses for MH students. This highlights the importance of prioritising PI in MHE beyond current practices. Patients should not merely share their stories as an adjunct to the course; rather, their educational

TABLE 5 | Discovered themes of needs of stakeholders concerning PI in MHE (Exploring the Needs of Stakeholders for Successful Patient Involvement in Mental Health Education, Netherlands, 2024).

Superordinate theme	Subordinate theme	Individual codes
Interpersonal Needs	Self-determination	Autonomy [21, 22, 25, 28] Being valued and recognised [21, 25, 27–29] Bring about change [21, 22, 25, 27, 28] Coming to terms with problems [30] Empowering patients [22, 25, 27, 28] Having hope [28] Learning to use own experiences [28]
	Communication and collaboration	Collaboration with mental health institutes [26] Collaborative approach between stakeholders [22, 25–27, 30, 37] Equality between patients and educators [21, 27, 28] Openness to other views [22, 25, 27, 28] Relationship development [21, 23, 24, 30] Trust [22, 28]
	Recognition and Support	Being ensured of employment [27] Companionship [21, 23] Debriefing [21, 23, 27, 28, 30] Emotional support [23, 25, 27, 37] Intellectual support [28, 37] Positive feedback or affirmation [21, 27] Practical support [23, 25, 27] Reduction of us-them thinking [22], [28] Relating to lived experience [22, 26–28] Take into account vulnerability [21, 23, 27, 29]
	Holistic approach	Holistic view on patients [26, 28, 37] Humanising patients [26–29] Positive psychology viewpoint [28, 29] Purposefulness consideration of personal story [22, 25, 27, 30] Self-help or community involvement [22]
Course Needs	Content Needs	Applicable knowledge [26, 27] Balance positive and negative experiences [22, 24, 25, 27, 37] Communicating authentic stories [25, 37] Discussion of therapies [24, 26, 28] Diversity of presented experiences [22, 24, 27] Early exposure to emotional content [27] Focus on emotional intelligence enhancement [27, 28, 37] Incorporate content into assessments [24, 28] Information on mental health journey [27] Learning from uncomfortable teaching [28] More course content [22, 24, 26, 37] Prioritise EBE lessons in the course [22, 24] Promote understanding of mental distress by students [27, 28, 37] Promotion of understanding of broad influence mental health problems [27, 28, 37] Value lived experience above knowledge [26–29]
	Organisational Needs	Address limitations by illness [23] Extend PI content outside of MH education [22, 24, 25, 37] Group discussion with all stakeholders [26–28] Information on mental health journey [27] Make PI course mandatory [24] More integration into the course [22, 22, 27–29] More interaction with students [21, 25, 26, 37] Need for continuous improvement [30] Online education opportunities [27] Practical and organisational resources [22] Prevention of tokenism [21–23, 29] Safe learning spaces to learn together [28] Time to reflect on PI content [25, 27, 37] Involve the right patient [28]
	Teaching Needs	Adapting to student's knowledge and experiences [25, 37] More interaction with students [21, 25, 26, 37] Avoiding the use of jargon [28] Training in teaching [22, 27, 29] Good communication skills [21, 28] Learning gains from uncomfortable teaching [28]

contributions should be seamlessly integrated into the broader curriculum and assessment methods [22–25, 27–29].

The subordinate theme *Organisational Needs* reflects the acknowledgement of specific requirements and considerations needed for successful PI courses at the organisational level. It encompasses how the courses with PI need to be planned, organised, and shaped, such as planning enough time to reflect on PI content and enhancing the integration of the PI content into an overarching course. Prevention of tokenism is a critical aspect of the organisational needs and relates to the subordinate category of *Interpersonal Need* to be recognised and supported as a patient educator. Tokenism occurs when individuals from underrepresented groups are included merely to give the appearance of diversity without truly valuing their contributions [39]. The course has to prevent a tokenistic approach to enable the interpersonal needs discussed above. Thoughtful selection of patients should align their experiences with learning objectives, fostering meaningful contributions and should be selected (by patient educators) based on these requirements [21–23, 29].

The subordinate theme *Teaching Needs* encompasses requirements for impactful learning. This involves adapting teaching methods to suit diverse student experiences and promoting active engagement and collaborative learning. Patients should possess adequate communication skills for teaching [28]. Stakeholders also advocate for PI in the selection of educators to maintain group momentum [21]. Furthermore, training in teaching is pointed out as essential. Acknowledging the value of uncomfortable teaching experiences fosters personal growth, encouraging the navigation of challenging situations and reconsidering assumptions [28].

A Comprehensive Checklist for Implementing PI in MHE

Based on the findings described above (also see **Table 5**), we developed a checklist (see **Supplementary Material**) for potential stakeholders to incorporate more frequent and more active PI in MHE. This checklist can serve as an evidence-based starting point for educators and curriculum developers in MHE to expand and assess PI in MHE. The checklist is compiled with the two main themes, and their subthemes that emerged from the review as described above: *Interpersonal Needs* consisting of *Self-determination*, *Communication and Collaboration*, *Recognition and Support*, and *Holistic approach*, and *Course Needs* consisting of *Content*, *Organisational*, and *Teaching*. For each theme, a comprehensive list of questions is provided that ensures a thorough check of all aspects of implementing or augmenting PI in MHE. This is the first comprehensive checklist for implementing PI in MHE based on a comprehensive literature review.

DISCUSSION

This scoping review aimed to comprehensively map the existing literature on PI in MHE and analyse and identify the needs of MH educators, students, and patients with lived experiences of MH challenges and develop a checklist for successful implementation of PI in MHE. This scoping review contributes to the field by

providing a preliminary map of evidence and providing a checklist for stakeholders aiming to incorporate PI in their MHE programmes.

Implications for MHE

The primary research questions, focusing on the needs of stakeholders in MHE, were addressed by an inductive content analysis and revealed two superordinate themes. These are *Interpersonal Needs*, consisting of the subordinate themes of *Self-determination*, *Communication and Collaboration*, *Recognition and Support* and a *Holistic Approach*, and *Course Needs*, consisting of *Content Needs*, *Organisational Needs* and *Teaching Needs*. Based on these themes, our checklist for successful PI in (MHE) emphasises patient autonomy, collaboration, and communication among all stakeholders with mutual respect and equality. Providing emotional and intellectual support for all parties, along with practical assistance for patients, is crucial. Additionally, adopting a positive psychology perspective that portrays patients as multidimensional individuals beyond their symptoms (see e.g., [40]) is essential for fostering positive interpersonal relations. In terms of the course, guidelines should focus on creating balanced and inclusive content that integrates patient stories effectively. Patients should also receive training for teaching and play an active role in selecting suitable candidates for MHE.

Implications for Research

The literature on PI in MHE reveals several gaps that need further research. There is a lack of standardised methods in research on PI in MHE, hindering the reliability of findings in this field. Standardised methods and consistent procedures could fill this gap.

The contextual variations present within different programmes and institutions in MHE are not adequately researched and thus present one of the literature gaps. For example, MH nursing and psychiatry involve medically schooled students and educators. Both disciplines fall between the social sciences and medical sciences, taking a different stance than clinical psychology students and educators who are social scientists [41]. Consequently, it becomes crucial for research efforts to not only acknowledge these contextual nuances but also actively seek to identify and address the specific challenges and opportunities they present. For instance, a PI intervention that proves successful in one psychiatric or MH training program may encounter obstacles or require modifications when implemented in a clinical psychology curriculum. Understanding these differences is necessary for tailoring PI strategies to suit the needs of each educational context, ultimately heightening the effectiveness of PI initiatives across various fields within MHE. Important criteria for developing these guidelines could be e.g., the relevance of the course content and assessment criteria to the specific educational needs per field. Our checklist is a preliminary attempt, yet more comprehensive guidelines need further research. Interpersonal needs criteria that may be researched are the possible differences in communication and collaboration between stakeholders in the field. Research on the differences between stakeholder needs in various fields of MH could include a programme-specific needs assessment and a qualitative exploration of stakeholder needs. After this, future research could explore strategies to adapt PI initiatives to

meet the specific needs of different MHE programmes to tackle programme-specific challenges.

In this scoping review, PI mainly centred on presenting patients' own lived experiences. Patients at higher levels of involvement (level 5 or 6 according to Towle et al.) are expected to express less desire for further involvement, empowerment, autonomy, and collaborative approaches, as these aspects are fundamental to their active educational role. Further research is needed to explore the needs of patients at different levels of Towle et al.'s taxonomy. Nonetheless, we recognise that since cutoff of our search, more studies with focus on PI in MHE have been published [42], including a qualitative systematic review, albeit with a different focus [43]. We acknowledge that we are situated in a dynamic research field and that there is the need for regular and rapid reviews to synthesize the knowledge produced in this emerging arena.

Limitations of the Study

One limitation of the current study is the subjective nature of the inductive content analysis and checklist development, wherein implicit references were extracted to uncover stakeholders' underlying needs. The initial review and data analysis process relied for a large part on the perspective of MK who was inherently involved in PI in MHE as a clinical psychology intern at the time of data analysis. Additionally, supervision and checklist development were undertaken by YN and EdB, clinical psychology practitioners, researchers and educators, who are themselves stakeholders. This positionality underscores the potential for bias in extracting and synthesising information, as individual perspectives may influence the identification and interpretation of stakeholders' needs [44]. To address this, future research could validate these findings through qualitative studies guided by the same research question, involving multiple researchers [45].

The absence of a quality assessment of the included studies, due to scoping nature of the review, constitutes another limitation. This absence of methodological evaluation may have led to the inclusion of methodologically flawed studies, potentially impacting the overall reliability of the findings. This limitation underscores the need for caution in generalising the identified needs, as the quality and validity of the included studies were not systematically appraised, and furthermore underscores the need for studies in this field with a sound methodological approach.

Furthermore, the analytical strategy employed in this study did not permit interpreting the interconnectedness of relationship between the needs of the different stakeholders. The relational nature of education, especially professional education, implies that the needs of one stakeholder is inherently connected to the needs of another. Additionally, due to the power differentials within the hierarchical structure of MHE, one stakeholder may be responsible for meeting the needs of the other. A full relational analysis was beyond the scope of this study. Future research studies could employ analytical approaches such as Situational Analysis to allow for a more comprehensive relational and positional analysis [46].

Lastly, there is a possibility that publications were not captured although efforts were made to include a diverse range of databases. The inclusion criteria also focused on English-language studies, potentially leading to the exclusion of relevant non-English literature that could provide valuable cross-cultural insights. This is

likely, considering the high inclusion of UK, Ireland, and Australia studies. The overrepresentation of research from the Happell et al. group suggests potential publication bias. To enhance understanding, future research should include diverse patient perspectives from additional countries and cultures. Comparative studies examining caregivers' viewpoints can also contribute to a comprehensive understanding of PI [47].

Conclusion

In conclusion, this scoping review provides a comprehensive overview of the existing literature on PI in MHE and identifies the needs of stakeholders, including students, MH professionals, and patients with lived experiences for successful PI implementation in MHE. Through an inductive content analysis, two overarching themes emerged: *Interpersonal Needs* and *Course Needs*, each comprising several subordinate themes. A checklist was constructed based on the content analysis findings. These offer valuable insights and practical tools for curriculum developers, educators, policymakers, and researchers, laying the groundwork for evidence-based guidelines to enhance PI in MHE. Addressing the identified gaps, such as standardising research methods, understanding contextual variations across MHE programs, and including diverse patient perspectives, presents opportunities for future research and practice in this area. Despite limitations, including the subjective nature of the analysis and potential publication bias, this study's comprehensive approach contributes to advancing our understanding of PI in MHE and underscores the importance of collaborative efforts to promote patient-centred education and practice in mental health.

AUTHOR CONTRIBUTIONS

YN and MK shaped the research question. MK and YN were responsible for the design and conceptualisation of the review. EB significantly contributed to the conceptualisation. MK conducted the search and screening. MK drafted the initial manuscript. YN and EB revised the manuscript for intellectual content. All authors contributed to the article and approved the submitted version.

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CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.ssph-journal.org/articles/10.3389/phrs.2025.1608124/full#supplementary-material>

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A Scoping Review Investigating the International Economic Evidence to Inform the Development of a Career Pathway for Home Support Workers

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Objectives: The aim of this scoping review is to explore the international evidence to identify the potential costs and gains of the development of a career pathway for Health Support Worker's (HSW's), the economic gains and benefits connected with continual professional development (CPD) and value for money.

Methods: Scoping review following JBI methodology was conducted of peer-reviewed international literature using structured searches of electronic databases and grey literature (September 2013–November 2023) applying economic methodological terms to capture economic evidence and perspectives on the issues.

Results: Seventeen papers were critically appraised and during the process of data extraction four key themes emerged: 1) Cost-benefits of employment and training 2) Organisational economic perspectives 3) Service economic perspectives and 4) Sector economic perspectives. This scoping review revealed a scarcity of economic evidence contributing to critical educational approaches, costs and benefits in development of career pathways for HSWs.

Conclusion: Limited evidence was available on benefits of specific training programmes, and considerable gaps in the evidence to inform future investment. Recommendation is that future research should incorporate economic theory within evaluations to inform policy and practice.

Keywords: economic, training programs, health support worker, career pathway, continuous professional development

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INTRODUCTION

Community-based care closer to home could provide more accessible and affordable care and reduce hospital admissions. However, to meet the growing demand for care and support in the community there is a need to increase workforce capacity by utilizing different types of public and private home support organizations and providers, recruiting more Home Support Workers (HSWs), and working in partnership with unpaid/family carers and community and voluntary networks. For the purposes of this article, "Home Support Worker" refers to an individual who is employed to provide support to a person in their private residence. Different terms are used internationally to describe this role (discussed later in this paper). "Home support" includes all forms of enabling support provided to or

for an adult, who by reason of illness, frailty or disability needs such support and assistance [1]. However, there is considerable variation in the nature and amount of support that clients need and that is provided in different contexts.

Internationally home support sectors face challenges in meeting the demand for care and streamlining the delivery of care. There are also challenges in recruiting and retaining HSWs due to multiple factors that include poor pay, working conditions, occupational stigma, and lack of opportunities for career development and career progression [1, 2]. Furthermore, countries lack a framework – a “career pathway” – that sets out opportunities for initial training/induction, Continuing Professional Development (CPD), career development and career progression. Here, we define CPD as an ongoing planned learning and development process that enhances knowledge acquisition and understanding for role enhancement and development.

In the context of Ireland, where this scoping review was conducted, the Department of Health (DoH) has emphasized that there are workforce challenges across the health and social care system that necessitate a proactive approach to expanding home support services [3]. The government’s Sláintecare implementation strategy aims to reform and modernize Irish health and social care services [3]. The strategy is supported by a government investment of up to €15 billion in health spending. This ambitious action plan aims to deliver a health service that gives the public access to high-quality, affordable care when needed. Central to the strategy is the recruitment of an additional 2,400 healthcare workers through the Enhanced Community Care Programme, which will increase the provision of specialist teams for older individuals and those living with chronic diseases in the community.

An HSW can be defined as a person trained to look after service users (clients or patients), often older people, in their own homes. However, there is considerable variation in job titles and tasks associated with the role within Ireland and internationally. In general terms the HSW role focuses on helping individuals to live their lives with dignity and as independently as possible. In some countries, such as Ireland, the United Kingdom (UK), Germany and Canada the role of HSWs is expanding or evolving with a shift in focus from the provision of personal care or domestic duties to including care activities previously provided by Regulated Health Professionals (RHPs) (referred to as “delegated care”).

In Ireland and other nations, sector leaders and researchers have argued that HSWs should provide care and support at a level that is commensurate with their training [1, 2]. To ensure client safety and quality of care the core competencies of the role should be clearly articulated and standardized along with increased training and support for HSWs to improve job satisfaction and retention [1]. There is a strong case for the development of career pathways to facilitate the development of competencies through from initial training/induction, through regular updating and reassessment of competencies, to the development of higher levels of skills and capabilities in the workforce [2]. Developing a more qualified workforce through a structured career pathway could benefit HSWs and clients alike, bringing greater growth and expanding skillsets in the sector, offering structures for reward and recognition, and increasing stability for health systems. Workforce research in the

health professions suggests that workplace learning is directly linked to employee job satisfaction and job performance – which is critical for safety and quality in the health sector [4].

Currently there is no clear career pathway, or associated CPD or career development framework for HSWs in Ireland. Alongside other limiting factors, this lack of a framework is hindering the effective recruitment and retention of HSWs into public and private provider organizations within the sector. A recent public consultation sought the views of organizations and individuals to help inform the development of draft regulations for Home Support Providers (HSPs) which included consideration of regulatory and commissioning issues [1]. The findings of this report indicated that the introduction of regulations for HSPs would significantly improve the quality and consistency of services, provide greater protection for service users, and provide greater guidance for all those involved in providing or receiving home support services. In addition, the findings of the report supported requirements for HSWs to have minimum educational qualifications that are attained within a set timeframe. The findings suggested that mandatory qualifications for HSWs could be a step towards the establishment of a career path with more structured pay and improved conditions such as opportunities for in-service learning (e.g., supervision, preceptorship or mentoring) and CPD [1].

Despite the need to increase the capacity and capability of the home support sector in Ireland and elsewhere, there could be considerable economic costs for the government, HSPs and HSWs. For example, the cost of implementing compliance assurance and meeting regulatory requirements, in terms of documentation and record keeping, along with the cost of education and training, or the cost of online professional development systems. The additional costs could be burdensome for all and undermine service provision. The counterargument is that the cost of staff turnover, which is a non-value-added element of an organization’s budget, could be far greater. This offset requires managers to focus on retention strategies to maximize the benefits of investing in trained and skilled HSWs. The huge and recurring expenses associated with high staff turnover mean that it is critical to find ways to improve employee job satisfaction and reduce turnover [5]. There are also potential cost savings to health systems if home support helps to keep people well and independent at home.

The aim of this paper is to examine international economic evidence on the actual or potential costs and benefits linked to the development of a career pathway for HSWs. The purpose is to guide the development of a career pathway for HSWs in Ireland, with insights transferable to other countries aiming to expand their home support workforce. The focus is on identifying evidence to inform decision-makers about where nations and organizations can invest or allocate economic resources to career development, training, and progression systems. This approach seeks to improve individual recruitment, retention, and progression, while also addressing the urgent need to expand and enhance workforce capability in alignment with population needs.

The objectives were to:

- 1) Identify relevant international economic evidence using a robust and replicable method.

- 2) Generate key themes from the data to highlight economic issues and identify any research gaps.

The investigation draws on a scoping review of the research literature, described below.

METHODS

A scoping review of the international research literature was chosen as a reliable and replicable method for investigating the international economic evidence [6]. It was conducted using the Joanna Briggs Institute (JBI) guidelines [7], which provide open access to guidance on the various stages involved, selection of data sources, systematic searches, presentation of data, analysis, and so on.

Search Strategy

The search strategy was developed to identify evidence on economic issues associated with the development of a career pathway, such as, for example, CPD, career development and career progression. Key search terms and eligibility criteria were developed from the literature. The key terms used are shown in **Supplementary File S1**. The first section of the search includes synonyms and related job titles for “home care support worker” using OR to include all variations. The NOT section removes terms unrelated to home support (excluded terms), preventing irrelevant results from terms such as “dental devices home care” or “veterinary.” Career Framework/Pathway Terms: This section includes terms related to career progression, training, and development relevant to HSW roles. Finally, the last section captures various economic and evaluation-related terms, allowing for studies of the economic impacts, cost-benefit analysis, and quality of life measures associated with home support work. This comprehensive search structure was designed to yield targeted results across different studies and databases. An example search string is included in **Supplementary File S1** for transparency and reproducibility.

Sources

Structured searches of electronic databases were undertaken on the Web of Science, PubMed, MEDLINE, EMBASE, CINAHL, PsycINFO, Social Care Online, and Social Sciences Citation Index. To target the most recent and relevant literature the searches were limited to articles published in the last 10 years (January 2013 to November 2023). References and abstracts were downloaded to Microsoft Excel for screening.

In addition to the structured searches, additional desk-based searches were conducted for “gray” literature (e.g., research reports, conference proceedings), and advice was sought from experts in the field in collaboration with the commissioners of the study. These additional sources of information provided a realist perspective on “what works, for whom and under what circumstances?” [8] and informed the discussion of the findings.

Eligibility Criteria

Inclusion and exclusion criteria were developed from the literature and applied to screen the articles. Article screening of titles, abstracts and full texts was conducted by two independent reviewers (EM, ML) to minimize bias and ensure rigor.

Charting

Full copies of included articles were downloaded from journal websites and were stored electronically. Data were extracted and charted in tables in Microsoft Word to generate a bibliography of international economic evidence (**Supplementary File S2**).

Assessment of the Level of Evidence

To gain insight into the overall level of international economic evidence, each article was assessed using the GRADE (Grading of Recommendations, Assessment, Development and Evaluation) approach [9]. Assessing the level of the available evidence is important for the development of reliable recommendations and ensuring transparency about the available evidence. Applying the GRADE criteria (further detail in **Supplementary File S2**), involves consideration of the following domains: the level of risk of bias; assessment of the inconsistency of the evidence; evaluation of the indirectness and effect of the evidence; imprecision of the results and publication bias. Taking these domains into consideration an overall assessment is made to categorize the evidence as high, moderate or low.

Analysis

A thematic analysis was conducted using an inductive-deductive approach. This approach was chosen as a technique to identify key issues and themes within the data. Thematic analysis of the included studies followed the processes of familiarization to understand the focus of the articles, identification of preliminary themes during data extraction, charting, and development of a thematic code framework. Theme headings were derived from the data and themes were reviewed and validated by the authors. A narrative was developed to describe the topics and issues covered by each of the four themes.

RESULTS

In this scoping review, 17 studies that met the inclusion criteria, provided economic evidence. Further details of the article types, titles, topics, methods and content of each article are provided in **Supplementary File S2**.

Thematic analysis revealed four themes:

- 1) Costs and benefits of employment and training (7 articles)
- 2) Sectoral economic perspectives (5 articles)
- 3) Organizational economic perspectives (3 articles)
- 4) Service economics perspectives (2 articles)

Each theme is described below in order of its strength in the literature.

Theme 1: Costs and Benefits of Employment and Training

Seven articles examined the first theme [10–16]. The level of evidence of the articles revolving around this theme was assessed as moderate ($n = 6$) and low ($n = 1$).

Research conducted in the United States by Luz et al., 2018 [10] examined the need for qualified, paid Personal Care Aides (PCAs) and the provision of adequate training focused on skills for person-centered care delivery in clients' homes. Results indicate that clients report higher satisfaction and better health outcomes along with significantly fewer falls and emergency department visits compared to clients whose PCAs had no specialized PCA training, along with a reduction in costly adverse events. Further details of the study are provided in the table in **Supplementary File S2**. Supporting this evidence, a 2015 study by Luz and Hanson [11] showed that the introduction of a PCA training program significantly improved learners' skills, employability, and job satisfaction. It also showed that PCAs' intent to stay was associated with increased confidence in their ability to undertake the role.

In another study of training in the United States, Fong et al., 2022 [12] examined the impact of a workforce training intervention on value-based payment measures in a large home-based population in New York. Evaluation results indicate that workforce training could benefit high-need and long-term care recipients along with clients with average levels of need.

Kemeny and Mabry, 2017 [13] conducted a mixed methods research study to investigate the relationships between best practices in Direct Care Worker (DCW) training and the structure and culture of long-term support services (LTSS). The findings suggest that public policy should address methods of training, not just content, and consider organizational variations in size, training evaluation practices, DCW integration, and DCW input in care planning. In addition, effective training that also incorporates support for organizations and supervisors is an important key aspect of the learning and working environment for DCWs.

Ayalon and Shinan-Altman, 2021 evaluated a training program for paid elder care workers. They documented that three quarters of the participants completed the training course but only one quarter of the participants continued to work as care workers afterward [14]. Three main challenges were identified: first, the gap between the vision of the program and real-life requirements and constraints. The second challenge concerned the definition of the new role which promoted personal growth compared with the traditional direct paid carer. The third challenge concerned the program's lack of integration between personal/physical care and emotional and psychological care. The findings stress the importance of conducting an adequate needs assessment before embarking on a new social program and the tension between an ideal prototype and real-life constraints. The findings also highlight the necessity for top-down processes, supported by the government to develop a new profession of community elderly care. However, this should not compromise the quality of qualifications and should include academic and practice-based learning [15].

Snyder et al., 2018 examined career transitions among individuals in selected entry-level healthcare occupations such

as HSW and their findings indicate that there is limited evidence of career progression in healthcare for individuals who remain in their occupations [16]. However, the findings also suggest that employers and educational institutions should consider efforts to help clarify pathways to advance the careers of individuals in entry-level healthcare occupations.

Theme 2: Sector Economic Perspectives

Under this theme four articles were deemed relevant [17–20] with a moderate level of evidence, along with a piece of gray literature that explored the pay gap in social care and how to close it [21].

A review of the literature exploring economic evaluation methods [17] identified discrepancies in the reporting of comparisons between outcomes with impacts on the decisions on the most appropriate healthcare interventions. Findings suggest that to be effective, the appropriate economic methodological approach should be central to the context and content of the specific interventions and conditions being evaluated.

Recent evidence exploring the costs and benefits of large-scale policy-directives or workforce development interventions evaluated the implementation of the Health Career Access Program (HCAP) for HSWs and feedback was positive from both providers and care receivers. Results also suggest that investing in and supporting the growth of an individual, reinforces the emphasis on the sustainment and longevity of a career building strategy for healthcare professionals [18].

Exploring the supply and demand challenges in the home care service market research investigated the difficulties arising from the market-oriented operation mechanism in optimizing the allocation of resources. Findings suggest that encouraging participants to diversify home-based care services, both providers and modes of provision could greatly improve the QOL (quality of life) of the elderly [19]. Research examining the cost-effectiveness and cost-utility of staff training [20] found that future research should integrate sound economic theory and that economic evaluation should include Social Cost Benefit Analysis (SCBA).

In light of the crisis in the social care workforce an investigative report looked at the pay of frontline carers compared with other publicly funded industries and challenged the categorization that social care is a "low-skilled" sector. The findings suggest that disparity and pay gap are at the heart of the crisis affecting social care. However, limited attention was given to the costs and benefits of the social care workforce, given that social care contributes £46 bn to the national economy each year, social care creates 1.65 m jobs each contributing to their local economy, and the sector loses 34% of its workforce each year [21].

Theme 3: Organizational Economic Perspectives

Three articles focused on this theme [22–24] and the level of evidence from the articles included in this theme was assessed as

moderate ($n = 1$) and low ($n = 2$) with the latter articles adopting a commentary approach to this topic.

Qualitative research examining efficiency requirements and managerial roles in the elderly care sector found that managers perceive that a new form of home care is emerging, where the main role of managers is to guide staff toward smarter use of resources demonstrating a shift in thinking [22]. However, this shift in thinking needs to take into account organizational economic views to address the organizational capacity to implement and deliver training agendas to include progression within the HSW role seen as a means of opening up the workforce. Central to this is the pre-eminent objective of HSW career development and supporting HSWs to grow within the role itself, enabling them to deliver high-quality care.

Issues of organizational capacity to deliver on the HSW agenda together with concerns about how to align the pursuit of different aims with the appropriate training and development programs. Career progression within the HSW role CPD training should be cognizant of the various roles, and training design options available, such as the higher development award while staying in their existing role [23]. To understand career progression, the perspective of HSWs needs to be considered along with the importance of functional skills, associated with limited funding for HSW training opportunities as a result of staff shortages [24].

Theme 4: Service Economic Perspectives

Two articles focused on this theme [25, 26] and the level of evidence in both articles was assessed as moderate.

Research was conducted to examine the benefits of workforce training in long-term care. The evaluation of a feasibility study was designed to determine the effects of a communication intervention on residents' quality of life (QOL) and care, along with care providers' perceived knowledge, mood, and burden. Results indicate that residents experienced a substantial increase in overall QOL and care providers had significant improvement in mood and perceived reduced burden [25]. Qualitative research investigating the costs and benefits of payment models examined the roles and tasks of HSWs along with the costs of improving efficiency and quality of care. Findings suggest that aligning payment models with quality requires an understanding of the full scope of services HSWs provide and a quality work environment that offers support and supervision, engages HSWs in patient care, and provides a voice in policy decisions [26].

DISCUSSION

This scoping review highlights several key economic challenges in supporting the training, CPD, career development and career progression of HSWs. A major gap exists in the conduct of comprehensive economic evaluations, especially cost-benefit analyses (CBAs) of CPD. Employment and training have been shown to yield benefits, such as improved skills, job satisfaction, and cost advantages in high-dependency and long-term care. Sustainable sector funding remains challenging, underscoring the need for needs assessment, workforce planning, and program evaluation for HSW career

development. Limited evidence on the economic value of qualifications and career pathways suggests a need to balance academic and practical learning.

Organizational perspectives, particularly regarding capacity and funding for training, are sparse, as is research on service economics; however, studies link workforce training to better outcomes for care recipients. Economic issues in the home support sector - pay disparities and staff shortages—are critical, demanding urgent economic solutions. Future research should adopt rigorous economic evaluation techniques, integrating cost-effectiveness, cost-utility, and Social Cost-Benefit Analysis (SCBA) in line with the Green Book guidance [27]. Investment in career pathways for HSWs is vital to both the sustainability of careers and the ability of the healthcare system to meet the growing demand for home-based and digitally supported care.

Evidence on the co-benefits of employment and training suggests that financial costs are offset by benefits such as increased service user satisfaction, improved health outcomes, and reductions in adverse events and healthcare usage [10]. The review highlights significant improvements in skills, employment opportunities, and job satisfaction, with training proving especially beneficial in high-dependency and long-term care settings [11, 12]. Strategic planning should integrate training and learning into work environments [13]. However, numerous challenges remain, and it is essential that governing organizations conduct needs assessments before developing and implementing new programs to support the progression of new roles in home support. Qualifications should encompass both academic and practice-based learning [14, 15]. Given the limited evidence on career progression, employers and educational institutions should consider ways to simplify pathways to facilitate career advancement for health support workers [16].

Research on organizational economic perspectives reveals limited available evidence; however, findings suggest that management perspectives advocate for more strategic use of resources by focusing on organizational capacity to implement and sustain training programs that support career progression within the role of HSWs [22]. Additionally, research into the views of HSWs is essential, particularly in relation to accessible CPD that considers their diverse roles, limited funding for training opportunities, and ongoing staff shortages.

This scoping review highlights the lack of research on service economics perspectives, with minimal evidence currently available. Findings suggest that investment in workforce training in long-term care may increase the quality of life (QOL) of end users, along with notable improvements in the attitudes of care providers [25]. Research into the costs and benefits of improving the efficiency and quality of care indicates that supportive and supervised work settings that actively involve HSWs in patient care, can lead to more effective health planning decisions [26]. Furthermore, evidence suggests that promoting and expanding home-based care services, through improved provider approaches and delivery methods, could significantly improve the QOL of the population [19].

There are several contextual limitations to these findings. First, the search and the studies reviewed encompass healthcare workers in

a range of care and clinical settings along with HSWs. It is evident that the costs and benefits of CPD and other career development or progression strategies are likely to vary significantly between these roles and settings. For an international journal audience, it is essential to highlight that this is an international scoping review. However, this also means that the roles, regulation, training, and positioning of HSWs within their respective health and care systems will differ from country to country, with implications for both costs and benefits in different settings.

Insights into the economic perspectives of the home support sector reveal the need to examine economic evaluation approaches, workforce supply-and-demand policies, and the widening pay gap that contributes to the ongoing staffing crisis. Significant disparities and a growing pay gap are at the core of the challenges impacting social care; however, there has been limited focus on assessing the sector's costs and benefits. Social care contributes £46 billion to the national economy each year, creating 1.65 million jobs and supporting local economies. However, the sector faces high staff turnover, with 34% of the workforce leaving each year [21].

Research applying rigorous economic evaluation techniques is extremely limited; however, the findings suggest that economic methodologies should be incorporated into all future evaluations to effectively capture inputs, outputs, outcomes, and impacts, and to demonstrate their monetary value and benefits. Recent economic evidence supports this, indicating that investment in HSW career pathways strengthens career sustainability and longevity in healthcare roles [18]. Building on this approach, by addressing the supply and demand challenges in the home care market, and improving resource allocation, findings suggest that the cost-effectiveness and cost-utility in staff training are crucial [20].

Limited evidence suggests that training can help reduce healthcare utilization and associated costs [28] and highlights the challenges that workforce training faces in meeting the demand for low-cost, high-quality care for increasingly diverse populations [10]. Recent findings point to the need to establish structured career pathways for HSWs that include key development areas such as data collection, care model transformation, career progression frameworks, and systems for safety and quality improvement [29]. Decision-makers in care systems face difficult economic realities, balancing public needs and aspirations with shrinking public and private resources. This necessitates challenging decisions on resource allocation to maximize performance. Reinforcing this approach, recent advocates suggest that policymakers and academic providers should redesign HSW training to meet the critical home care needs of a growing, aging population with complex needs [30].

A recent UK report on health and social care recruitment, training, and retention [31] called for a long-term, sustainable workforce strategy that emphasizes pay progression, professional development, and clear career pathways. It recommended that the Government introduce an externally validated, transferable care certificate for use across social care and the NHS, along with standardized training and progression routes to support career advancement in social care. This scoping review on optimizing CPD and HCW career pathways underlines the need for evidence on key economic issues, such as the necessity for needs assessments

before launching new government-supported social programs [14]. Future research should integrate economic perspectives and address current and future needs through cost-benefit analysis (CBA) to ensure efficient resource allocation and value for money.

Conclusion

The findings of this scoping review show there is an international scarcity of economic evidence to inform the development of career pathways for HSWs. Further research is required to build economic evidence and maximize the benefits of workforce investment costs. Expanding the home support sector could reduce costs to health systems but this requires research and evidence to inform decision-making at national and local levels.

AUTHOR CONTRIBUTIONS

ML: Conceptualization, Funding acquisition, Formal Analysis, Investigation, Project administration Methodology, Project administration, Validation, Writing original draft-review and editing. EM: Conceptualization, Data curation, Formal Analysis, Investigation, Project administration, Visualization, Writing-review and editing. All authors contributed to the article and approved the submitted version.

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CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.ssph-journal.org/articles/10.3389/phrs.2025.1607091/full#supplementary-material>

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Abu Dhabi Public Health Workforce Development: Learning Points From the Comparison of Six Countries

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Objectives: This study aimed to review the healthcare systems and the educational public health (PH) the workforce structures in six countries: the United Arab Emirates (UAE), the United States of America (USA), the Kingdom of Saudi Arabia (KSA), the United Kingdom (UK), Canada, and Singapore.

Methods: This review was developed by searching databases from the World Health Organization and the World Bank, official data from each country's respective ministries of health and National Bureaus of Statistics, the European Public Health Association, and studies conducted by educational institutions.

Results: The USA, the UK, and the KSA showed an insufficient concentration of PH specialists and educational opportunities. In contrast, Singapore and Canada incentivized citizens to pursue PH education, resulting in more PH physicians and specialists. The UAE (Abu Dhabi) was found to remain in its early stages of development.

Conclusion: To strengthen and advance the public health workforce in the UAE (Abu Dhabi) and the countries described, the concept needs to be defined and integrated fully into the entire health system, from academia to the transversal structures of the Ministries of Health.

Keywords: public health education, public health workforce development, Abu Dhabi, education of public health professionals, public health professionals

Abbreviations: ASPHER, The Association of Schools of PH in the European Region; GCC, Gulf Cooperation Council; KSA, Kingdom of Saudi Arabia; HCWs, Healthcare workers; MOH, Ministry of Health; MPH, Master's in PH; NUS, National University of Singapore; PHAC, Public Health Agency of Canada; UAE, United Arab Emirates; UK, United Kingdom; USA, United States of America; WHO, World Health Organization.

INTRODUCTION

According to the World Health Organization (WHO), “all persons engaged in activities with the sole purpose of promoting health are regarded as human resources for health” [1]. This definition encompasses those who support the overall effectiveness of a functioning health system, including healthcare workers (HCWs) who care for patients, those who address underlying health factors, and those who focus on the fundamental factors affecting health, as well as others who support the entire endeavor [2]. Public health professionals have been defined as those who are “educated in public health or a related discipline (. . .) employed to improve health through a population focus.” [3]. The public health workforce includes individuals engaged in public health activities that are the primary part of their role (core public health workforce) [4], and those who contribute to public health activities and essential public health operations as part of their job as well as other professionals whose work may significantly affect population health (wider public health workforce) [4]. Creating Public Health (PH) as a single discipline was a defining moment in the field as it established the discipline, separate and distinct from the practice of medicine. The number of PH schools varies significantly worldwide throughout North America (394), Latin America (124), Asia (448), Europe (457), Oceania (48), and Africa (124), with a global estimated total of over 1597 Schools of PH and/or PH variations [3].

Several factors impacted the competencies of the PH workforce and healthcare professionals during the COVID-19 pandemic and post-pandemic era [4]. These factors prompted further discussion and led to a reformation and redefinition of the capabilities and expertise of the healthcare workforce, and a new model of PH resource administration [4]. In this redefined PH model, public health workers are the ones who understand the situation, contain the spread, minimize the loss of human life, and prevent it from happening again [5]. Recently, the concept of PH has evolved to also include mental health.

The definition of PH was conceptualized by Charles Winslow in 1920 as “the science and practice of extending life, avoiding sickness, and improving health via society’s concerted efforts” [6].

To prevent and control disease in society, PH organizations have been founded to implement regulations and supervise, examine, and monitor the numerous factors that impact PH. These factors include water systems, food manufacturing and processing, sewage disposal, drainage, and contamination.

It is commonly acknowledged that enhancing PH necessitates trans-disciplinary cooperation and requires the collaborative efforts of professionals from various fields and disciplines. This trans-disciplinary cooperation includes healthcare workforce, journalists, pharmacists, social care staff, teachers, retail, and hospitality workers [7]. Nevertheless, many people enter the field of PH through a variety of routes, frequently with specialized knowledge of very limited elements of PH as opposed to a comprehension of the entire scope [8].

The WHO, in cooperation with the Association of Schools of Public Health in the European Regions (ASPHER), launched the WHO-ASPHER Competency Framework for the public health

workforce in 2020 to provide guidance for all policymakers, human resources for health, educational institutions, and PH research institutes [9]. In addition to determining, through re-evaluation, the demand for public and global health competencies, this guideline examines the transformative capacity of PH leadership to strengthen health professionals preparedness for global health emergencies [4]. The development of an adequate public health workforce should include in-depth “education, training, development, and evaluation” of the public health workforce to efficiently address priority PH problems and monitor PH activities [4]. Training does not and should not end at the post-secondary and graduate levels. There is a need for continuous in-service training in economics, bioethics, management of human resources, and leadership to attain and enhance the standard of PH service [7]. The certification processes of PH professionals specify the requirements of the workforce appropriate for PH training and experience [7].

The present study aims to contribute to the advancement of the public health workforce in Abu Dhabi, one of the seven Emirates that together form the United Arab Emirates (UAE), by describing its structure across health systems and PH education as developed in the reviewed countries: the United Arab Emirates (UAE), the United States of America (USA), the Kingdom of Saudi Arabia (KSA), the United Kingdom (UK), Canada and Singapore.

METHODS

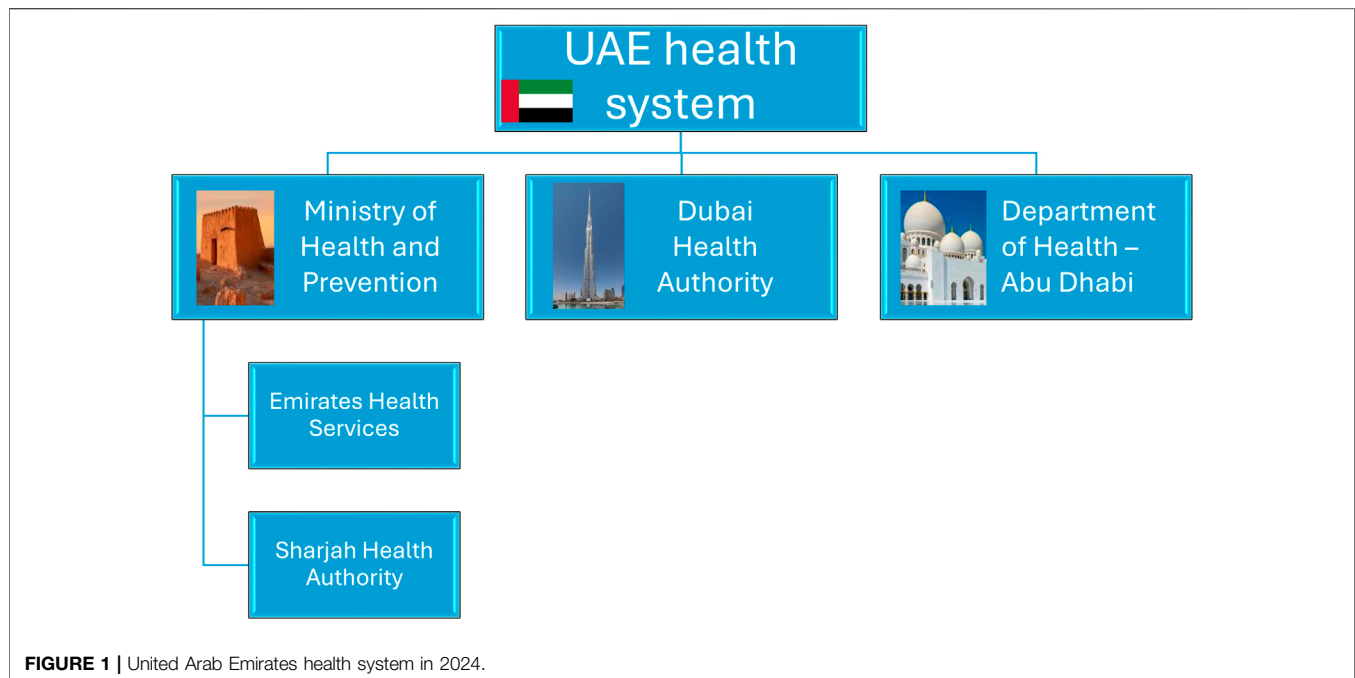
We conducted a literature review of healthcare systems, the educational structure of PH specialization, and the availability of public health workforce in six countries: the UAE, the USA, the KSA, the UK, Canada, and Singapore. A comprehensive search was done using Google Scholar to get information published by the WHO, the World Bank, ministries of health, and the national bureau of statistics from each country, the European Public Health Association, and international and peer-reviewed studies for each country without time span limitations. Then, the findings were synthesized to interpret the literature and develop a coherent narrative that summarizes the current state of the public health workforce.

RESULTS

Based on the analysis of the data collected, our results indicated that structural differences exist between the public health workforces in the six countries examined. The results indicate a need for countries to integrate the concept of PH into academic programs and PH competencies for all HCWs to develop a long-term PH strategy.

Public Health Workforce in the UAE (Abu Dhabi)

In the UAE, there is no specific history of PH. The first health facility dates to 1943 in Ras Al Khaimah, followed by another in



Al Ain in 1960. As per the records, the first PH concept started to be developed in 1972, when the Ministry of Health creation was announced due to the high mortality rates among the newborn babies [10]. There is limited information about the HCW in the UAE and its qualifications, as the Ministry of Health data indicates only the number of physicians, dentists, pharmacists, technicians, and nurses without their specializations [11]. This is due to the UAE healthcare organization comprising federal and emirates levels (**Figure 1**). Therefore, this study only focuses on the emirate of Abu Dhabi (excluding the Emirates of Dubai, Ajman, Ras Al-Khaima, Fujairah, Sharjah, Umm Al Quwain).

The Abu Dhabi Healthcare Strategic Plan cements the commitment of the government to advance healthcare services, covering the seven priority areas: (i) reducing capacity gaps, (ii) improving the quality of healthcare services, (iii) patient safety, (iv) retaining qualified healthcare professionals, (v) improving preparedness during emergencies, (vi) ensuring value for money and sustainability of healthcare spending, (vii) introducing an e-health program as a facilitator for the other priorities [12]. Between 2017 and 2019, there was a total of 2483 workers joining the healthcare field annually, totaling 54,231 health professionals registered in the emirate at the end of 2019 if growth remains steady [12]. It is estimated that by 2035, the number of physicians will increase by 50% to cope with the projected population growth and rising rates of chronic diseases. Without significant improvements, rates of obesity, diabetes, and cardiovascular diseases are expected to rise as the juvenile population ages [13, 14]. Cardiovascular diseases (CVD) accounted for 37% of all death cases in 2021, followed by injuries which accounted for 17%, and cancer caused 16%, from which 11.5% were due to breast cancer, 8.7% due to bronchus and lung cancer, and 8.5% due to colon cancer.

There is an oversupply of some specializations such as general medicine and gynaecology, while there is an undersupply of physicians specializing in trauma and injury, substance abuse, family medicine, PH, and oncology [12, 13].

Public Health Education in the UAE

The UAE boasts a highly competitive education industry in the Gulf Cooperation Council (GCC) region, where education is a primary government objective according to the “National Strategy for Higher Education 2030,” a comprehensive strategy devised to provide subsequent cohorts with theoretical and empirical skills to improve the market force [15, 16]. This national strategy also aims to strengthen accreditation standards, set a qualifications framework, and further develop the curricula to match international standards.

A specific professional PH license was introduced in 2011 when the Department of Health in Abu Dhabi (DOH) launched a special PH licensing system initially only targeted at medical doctors [17]. Currently, more than 20 colleges offer PH specializations and degrees varying from bachelor's to doctorate. The regulatory authorities set the requirements for licensing the graduate colleges per the Unified Healthcare Professional Qualification Requirements (PQR). Recently, in June 2021, the PQR reviewed the requirements for professional qualifications and included new criteria for licensing the PH workforce, such as new titles like PH Medicine, PH Professional, PH-Epidemiology, PH-Biostatistics, and PH-Environmental Health [17]. These recent changes aim to support the UAE healthcare system in establishing a strong PH taskforce.

Public Health Workforce in the KSA

In 1925, intending to ensure accessibility of healthcare for the visiting (hajj) and reside population, a royal decree launched the

first PH authority in Mecca. Later, in 1951, the Saudi Ministry of Health (MOH) was established [18]. The MOH was tasked with the management, supervision, and organization of healthcare and services. The primary task was to provide care and treatment for prevalent diseases and ailments. However, following the declaration of the Alma-Ata in 1978, the policy of the MOH was expanded to include the provision of preventative care with the establishment of primary healthcare [19]. Saudi nationals comprise 44% of the total health workforce and 29.5% of all physicians in the health sector [19]. In nursing, females are significantly underrepresented among Saudi citizens [20]. The health workforce faces significant challenges, including imbalance in professional skills, gender disparities, and accessibility to healthcare challenges. Given the country's prediction that the senior population would double over the next decade, the KSA is expected to continue spending extensively on healthcare facilities [20]. Life expectancy rises, and so will the need for a competent healthcare workforce over the following decade. The KSA needs a large boost in the number of healthcare providers to fulfill the expanding and aging demands of its population. They would need to employ between 6,000 and 7,000 new nurses every year. The limited training of physicians in the KSA has resulted in a substantial job shortage of family medical practitioners [21]. Around 5% of the doctors in KSA practice family medicine, adding to the country's healthcare employment challenge and necessitating precise strategic objectives for transformative change [21].

Public Health Education in the KSA

From 2015 to 2018 there was an increase of 9% in the number of programs offered in PH at both a bachelor and master's level. In 2018, half of the universities offer bachelor's degrees in PH or community health, and only six institutions offer master's degrees in PH [20]. Although certain government and commercial universities in KSA provide PH courses, developing qualified PH practitioners remains challenging. One obstacle is the shortage of a consistent PH curriculum taught in all colleges and educational institutions in the KSA. Since PH is concerned with eradicating and restraining illness, an effective and efficient workforce is needed to lead PH initiatives.

The KSA government is aiming to enhance the healthcare system. "Vision 2030" is a long-term plan for enhancing the country's public sectors, which include health, education, infrastructure, recreation, and tourism, consequently increasing the country's economy [20]. Administrative leadership of PH organizations want to limit new recruitment to PH specialties to address a skilled labor shortage in the following areas: epidemiology, environmental health, health education and promotion, food safety, and infection control [20]. A workforce with undergraduate and graduate degrees in PH specialization is necessary sided by the creation of more schools of PH. The introduction of PH courses at both levels, particularly in the discipline of epidemiology, is instrumental in the construction of a competent PH workforce.

Public Health Workforce in Singapore

Singapore's aging population raises the demand for chronic care, focusing on pre-existing or long-term sicknesses. Over the previous

decade, the number of older persons (over 65) with three or more chronic diseases nearly quadrupled, and by 2030, a quarter of Singapore's population would be over 65, potentially impacted by chronic illness and the need for chronic care [22]. Increased demand, along with a scarcity of local labor, has resulted in rising healthcare costs—more than Singapore's GDP growth. In a report published in 2022, the Ministry of Health stressed the importance of health public workers and the need to assist them [22].

According to the Ministry of Health's Healthcare 2020 Masterplan, an estimated 9,000 health personnel are still needed in PH care. Administrative, executive, and managerial posts in PH/healthcare-related statutory boards and agencies, hospital operations and affairs, healthcare human resource and finance, community health, and regional health systems are available for at least 20% of these (1,800 positions) [23]. To some extent, infection control and workforce planning initiatives influence medical/nursing students' education, training, and placement.

Public Health Education in Singapore

The National University of Singapore (NUS), Singapore's first and only higher education School of PH, has historically offered postgraduate PH education. In 2003, the Institute of Medicine advised that all students should be given access to PH education since it is an important aspect of citizen training [24]. Since 2013, the minor in PH has grown in popularity, with approximately 300 students enrolling annually, prompting NUS to consider offering more advanced PH courses to undergraduates. Concurrent with the worldwide trend of diverse degrees leading to better job opportunities, NUS senior management established second PH majors [24].

During the COVID-19 pandemic, Singapore placed emphasis on residency programs and institutions to address trainees' anxiety because of the epidemic and the resulting disturbance to their education [25]. According to recent studies, "personnel rosters and work schedules for deployed residents should be" carefully reviewed to ensure students do not spend excessive time away from core tasks essential to their training [25]. The MOH launched job listings for nurses who are not working, working as an agency, or working in non-nursing relevant areas to support the healthcare workforce in a non-COVID capacity. Nurses from non-COVID units were redeployed to care for COVID-19 patients. New deployed nurses required special training, such as managing patient specimens and securing patient transportation. With the requirement for robust infection control measures in healthcare facilities, workflow adjustments requiring precautions and frequent cleaning of equipment/environment were also adopted throughout non-COVID wards [25]. These were invariably followed by employee training.

Public Health Workforce in Canada

In 2003, after the devastating Severe Acute Respiratory Syndrome (SARS) outbreak, the country's PH established the federal Public Health Agency of Canada (PHAC) on the following year [26]. Its mission is to promote and sustain the Canadian population's health, services, and programs and implement regulations designed to enhance health, avoid harm and chronic illnesses, and react to health crises [27]. Front-line providers, consultants,

and experts from many fields and professions, such as medicine, nursing, and epidemiology, comprise PH professionals. In Canada, PH services are delivered through a partnership among three levels of government: local, provincial, and federal [27]. While all levels of government share responsibilities for PH, the number and direction of resources allotted for associated activities differ by province and territory. The PH environment in Canada is evolving to suit the country's rising population's demands and to address current health concerns, such as adverse health occurrences associated with chronic illnesses and unhealthy lifestyles. Furthermore, it will adapt in response to emerging PH challenges such as introducing tropical diseases, the northward expansion of infectious organisms due to climate change, and disease transmission associated with international travel. PH professionals interact directly with the general public and at-risk populations, or indirectly through monitoring, surveillance, or administrative work.

The percentage of Canadians who do not have access to a family physician or a healthcare team is at an all-time high, producing ripple effects across the health system and impeding patients' ability to obtain timely care [28]. According to the Canadian Institute for Health Information, the number of physicians in Canada will grow somewhat in 2020 (64). While the statistics are trending in the right direction, they do not fully reflect the challenges related to human health resources, which diminish the overall impact of these improvements. For example, Canada, with 2.7 physicians per 1,000 population, continues to lag behind other Organization for Economic Cooperation and Development member nations, which have 3.5 physicians per 1,000 population [27]. The vast rural areas of Canada present an additional challenge: although 19% of Canadians live in these regions, only 8% of physicians serve them (66). These inadequacies highlight the importance of an all-inclusive Canadian health human resource policy.

Public Health Education in Canada

The development of PH in Canada dates to 1867 [26]. PH workforce has a variety of educational backgrounds, including training in specific health professions (e.g., medicine, nursing), bachelor's degrees in PH, and graduate degrees such as research-oriented master's degrees or professional Master of PH. These professionals work on PH concerns, including occupational health, environmental health, health promotion, infectious illnesses, injuries, and chronic diseases. The PHAC conducts the Canadian Field Epidemiology Program, which offers applied epidemiology training to PH professionals as epidemiologists, PH specialists, doctors, and veterinarians [29]. In addition, the PHAC also provides online professional development courses for professionals. The seven core PH competency categories were formally released after extensive talks with the government, professional organizations, and representatives from numerous disciplines and pilot testing [29]. The epidemic has been identified as the tipping moment for many health personnel already in limited supply.

Before the pandemic, 30% of doctors reported severe levels of stress. COVID-19, conversely, has intensified the spiral of

healthcare workforce exhaustion and personnel shortages, putting hospitals at risk. Due to the shortage of primary care capacity, emergency departments are regularly overcrowded, and surgical backlogs continue to grow [30]. Monitoring health workforce supply is crucial for planning future health system demands and responding to disasters like the COVID-19 pandemic. Canada's two-year family medicine residency training is the quickest of all of the other nations examined, having a three- or four-year program [31].

Public Health Workforce in the USA

The healthcare system in the USA is divided into three levels: local, state, and federal. With dwindling populations and limited capacity, workforce growth has lagged in PH, posing several issues, including workers' abilities lagging due to technological advancements, procedures, and data for assessing and monitoring hiring workforce requirements. A society, a multisector health ecosystem, aspires to guarantee that every American has the chance to thrive. The most important job of PH will continue as a custodian of PH, directing the numerous institutions that impact the nation's health, such as training, infrastructure, and shelter. PH professionals will act as their communities' primary health strategists, forging cross-sector alliances and defining goals to promote community health while encouraging investment from local companies and others. Robust community markers will be benchmarks for measuring progress toward goals and holding leaders accountable. They simplified this strategic vision into reinforcing characteristics, with the goal of the healthiest nations by building a PH movement, strengthening PH practice, and aligning organizational capacity and infrastructure [32]. In May 2021, the US White House announced plans to invest \$7.4 billion to recruit and train public-health workers. During a COVID-19 surge, focusing on anything beyond the immediate pandemic response was hard. However, rebuilding the public health workforce simultaneously is crucial for improving long-term health outcomes. The significant investment in public health comes after the pandemic exposed years of under-investment in the field. For decades, visionary leaders have envisioned a transformed future for public health.

Public Health Education in the USA

According to data collected in 2020 by the "Council on Education for PH", in the USA alone, there are 68 Schools of PH and 177 universities that offer a Master of PH or PH-affiliated programs (community medicine, health science, health promotion) [4]. The USA residency model impacts training that includes rotations across multiple sub-specialties in different institutions (with the cessation of cross-institutional rotations), preventing the achievement of target case log numbers and redeployment to outbreak management roles. The COVID-19 pandemic has emphasized the need for a robust and diversified PH workforce, according to the "PH and Social Services Emergency Fund" [33].

TABLE 1 | Public health approach in the United Arab Emirates, United States of America, Kingdom of Saudi Arabia, United Kingdom, Canada and Singapore up to 2024.

Category	United Arab Emirates	United States of America	Kingdom of Saudi Arabia	United Kingdom	Canada	Singapore
Historical Context	1972, early stages of PH	1872, established system	1925, evolving PH policies	1848, early PH initiatives	1869, evolving PH landscape	2013, recent focus on PH
Public Health Education	Competitive education sector, over 20 colleges offering Public health degrees	68 Schools of PH, extensive MPH programs	Increasing PH programs, lack of standardized curriculum	30 universities offering PH degrees	Diverse educational backgrounds, continuous professional development	NUS offering PH programs, increasing popularity
Workforce Structure	No specific data on specializations, PH license since 2011	Fragmented system, local/state/federal levels	Managed by MOH, high reliance on expatriate workforce	NHS with local government roles	Federal/provincial/local partnership, PHAC established	Ministry of Health managing healthcare, aging population focus
Workforce Statistics	46.19 PH professionals per 10000 (2014), 28.79 doctors per 10000 (2021)	117.13 PH professionals per 10000 (2014), 35.85 doctors per 10000 (2021)	77.74 PH professionals per 10000 (2014), 27.89 doctors per 10000 (2021)	112.5 PH professionals per 10000 (2016), 31.71 doctors per 10000 (2021)	123.8 PH professionals per 10000 (2015), 24.64 doctors per 10000 (2021)	93.97 PH professionals per 10000 (2016), 24.34 doctors per 10000 (2019)
Challenges	Need for structured PH education, licensing	Workforce lagging in technology and procedures, need for investment	Lack of standardized curriculum, insufficient local workforce	Workforce pressure, high attrition rates	Need for continuous adaptation to new health threats	Increased demand for chronic care, rising healthcare costs
Innovations	Abu Dhabi Healthcare Strategic Plan	\$7.4 billion investment in PH workforce	Vision 2030 for healthcare improvement	National Health Services long-term workforce plan	Canadian Field Epidemiology Program	Healthcare 2020 Masterplan

Public Health Workforce in the UK

The UK has a National Health Service (NHS), with local governments granted significant implementation authority. The NHS delivers comprehensive coverage for most health services, including hospitals, general practice, and PH, in three types of care: primary healthcare, secondary care (specialist consultation), and tertiary services. Nowadays, the NHS considers that HCWs pose a more considerable danger to healthcare than financial constraints. Based on current trends, the gap between the number of needed HCWs and the number of available employees might reach around 250,000 by 2030 [34]. If the current trend of HCWs leaving employment continues, and the pipeline of freshly qualified workers and overseas recruits does not grow sufficiently, this figure might climb to more than 350,000 by 2030 [34]. The recent shortages are driven by several factors, including fragmented national responsibility for workforce issues, inadequate career management, reduced financial support for training, stricter immigration policies worsened by Brexit, and an alarmingly high number of physicians and nurses leaving their jobs early. The workforce cannot be addressed without reinvesting in and developing staff. The NHS workforce is likely to remain under strain in the coming years, with insufficient staff facing overwhelming workloads, unrealistic expectations, fatigue, and moral distress, all of which were intensified by the impact of COVID-19.

Public Health Education in the UK

A survey conducted in 2011 reported the UK had 30 universities offering post-graduate and graduate qualifications in PH [35]. The PH Act of 1848 in the UK set up the General Board of Health, advising on PH issues such as epidemics and illness prevention. It was also given the authority to form and manage local health

boards. **Tables 1, 2** summarize the overview of the public health workforce under analysis in this review.

DISCUSSION

Over the years, the vision for PH has centered on building a robust health system that focuses on predicting and proactively preventing illness at the community level rather than providing reactive care once someone becomes sick. Preventing illness can reduce both healthcare costs and the severity of diseases. PH involves the collaborative efforts of many individuals and organizations working to protect and improve the health of populations.

The results indicate a need for countries to integrate the concept of PH into academic programs and PH competencies for all HCWs to develop a long-term PH strategy. WHO has outlined the three fundamental tasks of a PH system: “assessment and monitoring of the health of communities and populations at risk to identify health problems and priorities; formulation of public policies designed to solve identified local and national health problems and priorities; assure that all populations have access to appropriate and cost-effective care, including health promotion and disease prevention services” [36]. These functions are primarily carried out by a “core” PH workforce, such as executives of PH, experts, academics, and practitioners who have been trained in key areas of PH and work in various services in diverse organizations.

The function of a larger group of individuals, PH workforce, in the PH system is becoming more widely recognized. Reliable delivery of public health services depends on effective surveillance and evaluation of population health and wellbeing, assessment of

TABLE 2 | Public health overview in the United Arab Emirates, United States of America, Kingdom of Saudi Arabia, United Kingdom, Canada and Singapore up to 2024.

Country	First PH Education Established	PH Recognized as a Clinical Discipline	PH Professionals per Head of Population	Membership in International Organizations	Key messages
UAE	1972	No	46.19 (2014)	None	Early stages, need for structured PH education and licensing
USA	1872	Yes	117.13 (2014)	American Public Health Association, Healthcare without Harm, etc.	Need for robust public health workforce infrastructure, substantial investment in training
KSA	1925	Yes	77.74 (2014)	None	Need for standardized PH curriculum, increasing PH education programs
UK	1848	Yes	112.5 (2016)	Faculty of PH, Royal Society for PH, etc.	High workforce pressure, need for workforce reinvestment
Canada	1869	Yes	123.8 (2015)	CPHA, others	Evolving PH landscape, need for continuous adaptation
Singapore	2013 (for all population as a minor)	Yes	93.97 (2016)	None	Demand for chronic care, need for expanded PH education

Global health Observatory. Data. GHO. Indicators. Medical doctors. 2025 Accessed on 2 Jun 2025 ([https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-\(per-10-000-population\)\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-(per-10-000-population))))

evidence for the efficacy of health and healthcare interventions, utilization of community resources, development and implementation of policies, and strong leadership to ensure the quality of healthcare, preventive services, and overall health-related services. The public health workforce is likely to remain under strain in the coming years if healthcare workers continue to face unreasonable workloads, unrealistic expectations, fatigue, and moral distress, all worsened by the impact of the COVID-19 pandemic. Without sufficient clinical staff, the healthcare system will struggle to recover, let alone thrive. The six countries have a higher number of clinicians per head of population in comparison to the global average/mean (36 per 10,000 population in 2019). However, differences in public health system exist between the six systems/countries [37]. The COVID-19 pandemic has shifted the concept of public health from focusing solely on health promotion, lifestyle, and preventable diseases to a more holistic approach. This new perspective goes beyond traditional clinical health to include reactive care, encompassing social, political, economic, environmental, and geographic determinants. The results indicate a need for countries to integrate the concept of PH into academic programs and PH competencies for all HCWs to develop a long-term PH strategy. Substantially improving health outcomes requires both system transformation and cross-sector collaboration. Today, there are unprecedented opportunities to revamp the fundamental mechanisms of public health, both in terms of public attention and government financial support [38]. There are tremendous challenges: decades-long financial backlog, a worldwide pandemic, ongoing avoidable chronic disease epidemics, the rising threat of climate change, and entrenched injustices that jeopardize our health, longevity, and faith in government and its leadership. A strong PH workforce may positively impact these uncertainties.

In the UAE, the criteria for the PH specialty were not found, and this will certainly negatively affect doctors' interest in choosing it. In the KSA, despite PH education has shown an increase, it would take a long time to fulfil the need of a

competent PH workforce. There are challenges in developing competent PH professionals. One challenge is the lack of a standardized PH curriculum offered in all universities and educational institutions. The administrative leadership of PH organizations is planning to restrict the new recruitment to PH specialty to overcome competent workforce shortage to cover the following specialties: epidemiology, environmental health, PH education and promotion, food safety, and infection control.

In Singapore, the Institute of Medicine recommended that all undergraduates have access to education in PH as it is an essential part of citizen training. By May 2020, volunteers were recruited to form medical teams that went into the dormitories to assist in testing and implementing safe management measures.

The PH landscape in Canada continues to evolve to meet the growing needs of its population and address existing health challenges. Moreover, it continues to adapt further in response to new PH threats. PH professionals are directly involved with the public and subsets of at-risk populations or indirectly involved with the public through monitoring, surveillance, or administrative work.

The UK was one of the first countries in the world to take an early interest in PH. Several critical aspects impact rethinking competency development for PH and other healthcare professionals during COVID-19 and the post-pandemic.

The COVID-19 pandemic has exacerbated existing healthcare challenges, putting immense pressure on overburdened health facilities, increasing surgical backlogs, and pushing healthcare workers to the verge of collapse.

As an example, the main challenges for the public health workforce during the COVID-19 pandemic can be summarized as:

Workforce shortages and high attrition rates: Several countries, such as the USA and the UK, faced a significant shortage of public health professionals, leading to workforce strain. High attrition rates exacerbated these shortages, particularly due to burnout, fatigue, and moral discomfort.

Technological and procedural gap: In countries like the USA, public health professionals struggled with keeping up with technological advancements and updated procedures, which became critical in assessing and monitoring workforce requirements during the pandemic.

Inadequate public health education and training: As observed in countries like Saudi Arabia, gaps existed in the standardized curriculum and continuous professional development. This resulted in a lack of preparedness and sufficient expertise to manage health crises effectively.

Fragmented healthcare systems: Countries with fragmented healthcare systems, such as the USA, faced difficulties coordinating efforts across local, state, and federal levels. This led to inefficiencies in deploying and managing the public health workforce.

Workload and burnout: Public health professionals faced unrealistic workloads, leading to fatigue and burnout, as seen in the UK's NHS. The pandemic added extra pressure on the already strained workforce, increasing the risk of mental and physical exhaustion.

Need for expanded training and leadership: Continuous in-service training, especially in crisis management, epidemiology, bioethics, and leadership, was identified as crucial to addressing global health emergencies. However, many countries struggled to provide the necessary training, resulting in a lack of preparedness for handling the pandemic effectively.

Chronic disease management: In Singapore and other aging populations, the growing demand for chronic care further strained the public health workforce during the pandemic, as resources were diverted to handle COVID-19 patients.

Insufficient public health infrastructure: Countries like the UAE were still in the early stages of public health workforce development, which limited their ability to manage the pandemic effectively. This highlights the need for structured education and workforce licensing.

These challenges underscored the need for system transformation, enhanced workforce resilience, and cross-sector collaboration to better prepare for future global health emergencies.

A resilient system of health where the focus is to predict and proactively prevent illness at a community level rather than provide reactive care when an individual gets sick. Today, there are unique opportunities both in public attention and government financial support to reform the underlying structures of the PH workforce. However, there are also extreme challenges. PH's most vital role as a steward of population health will remain unchanged, guiding the disparate systems that influence the nation's health. PH leaders will serve as principal health strategists of their communities, forming partnerships across sectors and setting goals to improve community health, inspiring investment from local businesses and others.

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Conclusion

This study provides actionable insights and highlights the importance of developing a well-structured and competent public health workforce by comparing these diverse healthcare systems. The analysis underscores the need for universal public health competencies, continuous professional development, and integration of public health into academic and governmental structures. These findings are crucial for Abu Dhabi and other regions aiming to advance their public health systems in preparation for future global health challenges.

Key Messages

This review provides an overview of PH workforce development, being the first to include countries from the Gulf Cooperation Countries, Middle East.

Innovating PH competencies stretches far beyond individual competence development. Moreover, it is about resilience and preparedness and calls for learning, working, leading, and governing differently.

Critical PH competencies are not limited to the PH workforce but must become relevant for all healthcare professions.

PH must be considered in all areas and at all levels of health workforce education, planning, policy, and governance to achieve transformative capacity toward improved health workforce resilience and preparedness for global PH emergencies.

Evolving disease burden towards a high prevalence of non-communicable diseases, which constitute more than 85% of the disease burden in developed countries.

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TA and MP conceptualized the review in discussion with scientific input from KC and MG. TA wrote the draft of the manuscript. All authors contributed to the article and approved the submitted version.

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Health Promotion in European Higher Education Institutions: An Integrative Literature Review

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Objectives: This research aimed to determine the state of the art of health promotion actions in higher education institutions of European Union member countries.

Methods: To achieve the proposed objective, an integrative literature review was conducted. The collection of analyzed articles was carried out across four databases and a data compilation, where studies published between 2016 and 2022 were reviewed. The analysis was conducted through the description of the actions in health promotion (HP).

Results: Fourteen articles were selected for analysis. The HP actions described primarily target students. Some of the main topics covered in the studies are health habits related to gender differences, recreational substances and health education.

Conclusion: Although research in this area is increasing, it appears necessary to further disseminate the principles of the health promotion universities movement to raise awareness across the entire academic community. This could more easily lead to the development of more effective HP actions directed at the entire academic community and those outside the institutions.

Keywords: colleges, health promotion, health-promoting universities, healthy universities, higher education

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INTRODUCTION

The concept of health promotion (HP) is related to "a decent standard of living, good labor conditions, education, physical culture, means of rest and recreation." [1].

Spaces such as workplaces, institutions that provide health services, as well as educational environments like schools and universities, have great potential for implementing actions and projects in HP. The way these locations are structured and organized allows for the intersectoral coordination necessary to achieve the objectives of an HP intervention [2]. Among the sectors mentioned, higher education institutions (HEIs) play an important role in our society. These institutions are responsible for preparing future professionals, individuals who will occupy decision-making positions in the future and manage key sectors [3]. Thus, HEIs have come to be seen as extremely promising contexts for developing health-promoting spaces, both for their educational community and the communities they are part of [4].

From there, the movement of Health Promoting Universities (HPUs) began to gain momentum and followers, leading to its official establishment in 1996 through the First International Conference on Health Promoting Universities, hosted by the University of Lancaster in England [5]. Building a

health-promoting HEI involves developing a health culture by integrating institutional processes and policies. The institution should aim to empower its target audience, create actions in a participatory manner with all sectors, and consider goals to be achieved concerning equity, environmental sustainability, and health-friendly work conditions [6].

Regarding the various guiding documents for HPUs, the Okanagan Charter [7], published in 2015, serves as a guide for the development of HP actions and policies in HEIs. This document, published following the International Conference on Health Promoting Universities & Colleges, serves as an inspiration for institutions and mandates that HP be developed holistically, emphasizing intersectoral collaboration and adhering to certain guiding principles. These principles aim to create an HEI that reflects an educational and work environment promoting health for its academic community and surrounding community [8]. Thus, the analysis of actions by HEIs aligned with the HPU movement finds in the Okanagan Charter an appropriate guiding document for evaluating their HP policies and interventions.

In recent years, the European Union has witnessed the spread of the HPU movement and the multiplication of various HPU networks within its territory, such as the German Network of Health Promoting Universities, the UK National Healthy Universities Network, and the Spanish Network of Healthy Universities [9].

At this point, it seems important to take stock, based on scientific literature, of the HP actions of European Union HEIs, characterizing them through a descriptive analysis and supplementarily through the Okanagan Charter. The characterization refers to the target audience of the action, the objectives of the action and the stages of implementation of the interventions.

METHODS

To characterize the interventions and actions in HP at European HEIs, an integrative literature review was conducted [10], encompassing the following steps: formulation of the guiding research question, establishment of criteria for the inclusion and exclusion of documents to be analyzed, determination of the information to be extracted from the selected documents, conducting a critical analysis of the selected documents, and finally, discussion, synthesis, and presentation of the results.

To formulate the guiding research question for the integrative review, the PICO strategy was employed [11]. The population comprised the academic community of European Union higher education institutions (HEIs). The intervention was related to HP in these institutions, with comparison made through the articles included in the integrative literature review. The outcome refers to the characterization of HP actions in the chosen population. Both quantitative, qualitative, and mixed-method studies were selected. Based on these elements, the guiding question was formulated as follows: “What are the characteristics of health promotion interventions related to the health-promoting universities network movement in European Union?”

Document selection was conducted in April 2023 through online access to reference databases in the fields of health and education: Biblioteca Virtual em Saúde (BVS–Virtual Health Library), Education Research Information Center (ERIC), PubMed, Scopus, and Web of Science. The keywords “Health promoting universities,” “Healthy universities,” and “Health promoting universities network” were combined with the keywords “students” and “education” using Boolean operators OR and AND.

“Health promoting universities” OR “Healthy universities” OR “Health promoting universities network” AND “students” AND “education” was the *string* used. It was specified in the databases that the terms should appear in the title, abstract, or keywords of the articles.

Inclusion criteria for the articles were as follows: documents in Portuguese, English, or Spanish that addressed the research question previously established for the study. Additionally, publications considered for the research were complete articles published in scientific journals that either focused on the topic of health promotion in HEIs or utilized the health-promoting universities (HPUs) model as the guiding concept of the study. Finally, we chose the articles using the following quality criteria: citation of the article by other authors, clearly defined objectives, presence of consistent methodology, conclusions in accordance with the objectives and conclusions supported by the results. The selected studies for analysis were also subject to a publication date criterion, with only studies published from 2016 to 2022 being analyzed, given that the Okanagan Charter, the document used for study analysis, was published in 2015.

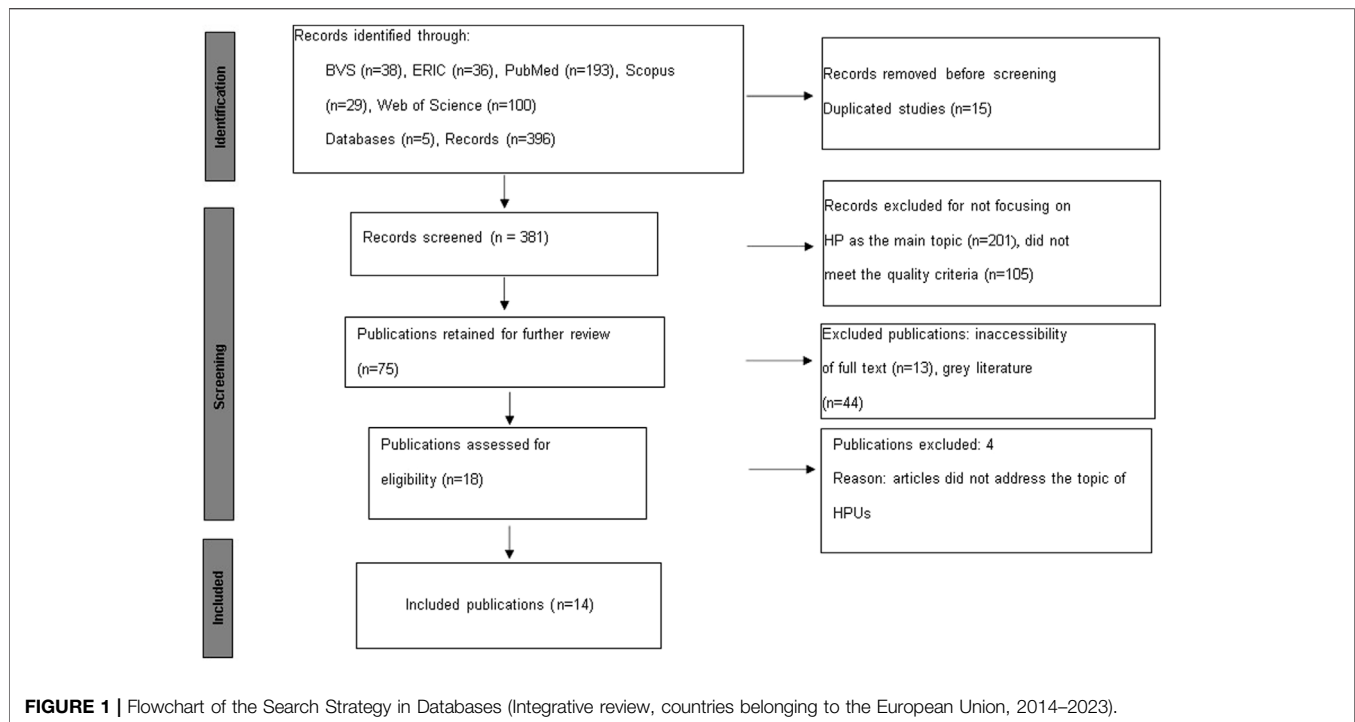
A total of 396 articles were found in the initial search. The list of documents was exported from each database in.csv format for subsequent upload into the free software Ryyan. The articles were analyzed and selected according to the established criteria. **Figure 1** details the flowchart followed in the process of obtaining the analyzed documents.

The analysis of all the articles was conducted through the description of the actions in HP and supplementarily according to the principles of the HPU movement, using the criteria established in the “Okanagan Charter”, specifically ensuring approaches encompass all university functions, developing transdisciplinary and intersectoral collaboration, valuing local communities and taking responsibility for current universal needs, particularly in the area of environmental health. The results of the health promotion actions were analyzed considering their scope within the institution and their impact on the academic community.

To aid in the study of the documents, a table was created outlining the key components of each investigation. **Table 1** presents specific elements of each document.

RESULTS AND DISCUSSION

Regarding the methodological approach used, 12 articles employed quantitative methodology, while two used qualitative methods (E1 and E5). Cross-sectional design was the most used



type in the selected studies, with research E6, E8, and E13 utilizing longitudinal design. Based on the analysis of the selected studies, two categories were created according to the approach used in the study. The first category refers to studies aimed at measuring some aspect related to HP. These are diagnostic studies, including behavioral, educational, epidemiological, administrative, or organizational diagnostics. The second category pertains to studies that describe HP practices in HEIs. A larger number of the analyzed investigations belong to the first group.

Diagnostic Research

Diagnostic Studies in the Student Population

These investigations specifically focus on the general use of healthcare services, dietary behaviors, alcohol consumption, smoking, sexual health, mental health, and the use of illicit psychoactive substances (E2, E3, E4, E10, E13, and E14). The studies aim to collect data for a future health promotion (HP) action plan directed at university students. Study E9 also belongs to this subgroup; however, the authors focus on analyzing the data collection instrument, as described further below.

In E2, the researchers distributed a 60-item questionnaire via institutional email to collect data on students' health behaviors. In this study, the questionnaire was developed by the research team and made available online through the university's email to all students attending the campus. To ensure the success of the research, the university's service department collaborated closely with the researchers. As a result, the investigators observed, among other data, a higher prevalence of tobacco use among male students.

In E3, while investigating changes in health habits among university students in London, the researchers collaborated with student associations to distribute the data collection instrument. Support from the student sector contributed to a sense of value for this group within the university, as well as making the research instrument more widely accepted. It was concluded that university students at the analyzed HEIs have healthier habits compared to those reported in previous studies, suggesting an improvement in healthcare among the student population.

Within the group of diagnostic studies, in study E4, Irish researchers analyzed health behaviors and lifestyles of university students, including differences in lifestyles between men and women. To this end, a questionnaire was also developed and made available to all enrolled students at the studied HEI. The researchers found discrepancies in men and women regarding their actual weight and overweight status, with this discrepancy being more significant among men. This result is presumed to be related to aesthetic pressures directed towards the female population, in addition to the already documented finding that women are more concerned with health issues. Furthermore, the study also observed a greater tendency among women towards healthier eating, lower involvement in excessive alcohol use and recreational substances, and fewer sexual partners over their lifetime. However, female students reported higher stress levels and lower tendencies to remain physically active compared to men.

In study E10, the researchers examined the lifestyle and health resources of university students from six Swedish HEIs, specifically from health and social care programs. The aim was

TABLE 1 | Summary of selected articles from online databases. (Integrative review, countries belonging to the European Union, 2014–2023).

Reference number	Authors/Year	Country	Objectives	Participants	Actions
E1	Newton et al. [12]	England	Study how the concept of “healthy university” is operationalized in two British universities	Students and staff at two British universities	Document analysis Field observation Semi-structured interviews with students and staff
E2	Holt and Powell [13]	England	To examine the health behaviors of students at a British university	University students at a British university	Preparation and application of a structured online questionnaire
E3	Haas et al. [14]	England	Analyze the extent to which university students are seeking to improve their health habits	University students from two London universities	Application of a structured online questionnaire on changes in health habits
E4	Bickerdike et al. [15]	Ireland	To examine differences in health behavior between the sexes and identify positive predictors of mental health in an Irish HEI	University students at an Irish university	Application of a structured online questionnaire on health habits
E5	Jack et al. [16]	England	To study how well a London HEI is meeting the psychosocial wellbeing needs of immigrant students	Immigrant university students at a London university	Application of narrative research, photovoice and interviews with key informants
E6	Martínez García and Zambrano Álvarez [17]	Spain	Describe the HP actions carried out at the University	Academic community of the Pablo de Olavide University and society in general in the Andalusia region	Events: World Health Day, World AIDS Day Training lectures: Eating habits, Health, society and education, affective-sexual education, meditation, eating disorders. Round tables with professionals on youth and health, mediterranean nutrition and therapy Training of health multipliers in the youth group to replicate knowledge among youth inside and outside the university. Alternative campaigns created by students
E7	Bachet et al. [18]	Germany	To research the level of collaboration between key actors to promote the health of the academic community through network analysis at a German university	Those responsible for the sectors that contribute to HP at the university under study	Identification of actors in the HEIs Application of a semi-structured questionnaire Data analysis using the SPSS software
E8	Limuratti et al. [19]	Austria	Demonstrate the effectiveness of a HP program entitled “healthy study start”	University students at an Austrian university	Survey of students’ needs through a questionnaire Development and implementation of a PdS program called “healthy study start” where the notion of coherence, sociability and notions of collective work are worked on Testing the effectiveness of the program through surveys with students participating in the program
E9	Reichel et al. [20]	Germany	Exemplify how to conduct effective health research with university audiences Provide a platform for discussions and suggestions for future investigations	Students at the University of Mainz, Germany	Aplicação de questionário e análise dos dados levantados
E10	Ahlstrand et al. [21]	Sweden	To describe HP resources and health-related factors in a group of students from universities in southern Sweden	First-year higher education students studying health and social services	Distribution of questionnaires among the target audience and analysis of the data collected
E11	Brandão et al. [22]	Portugal	Describe the development of an e-health monitoring program entitled “integrated e-health monitoring system for health management in Universities (e.cuidHaMUs™). The program aims to detect risk behaviors related to non-communicable diseases and implement problem-solving measures	Professionals working at the university of Aveiro, Portugal	Presentation of the design of the e.cuidHaMUs™ program. Development of an eHealth web platform to share information between different stakeholders. Application of a questionnaire to assess the health status of workers at higher education institutions (e.cuidHaMUs.QueST®)
E12	Gonçalves and Romero-Rodríguez [23]	Portugal and Spain	To evaluate the knowledge and practices of cooks associated with salt in public universities in the north of Portugal and Spain	Food handlers working in university canteens in northern Portugal and Spain	Application of a questionnaire among food handlers and analysis of the data collected
E13	Sanchis-Soler et al. [24]	Spain	To analyze the effects of a training program on the level of physical		Submission of 14 students to a physical activity training program developed for the

(Continued on following page)

TABLE 1 | (Continued) Summary of selected articles from online databases. (Integrative review, countries belonging to the European Union, 2014–2023).

Reference number	Authors/Year	Country	Objectives	Participants	Actions
			activity, mental health and body composition in sedentary university students	University students, self-declared sedentary, from a Spanish university	research in question Application of a questionnaire to measure sleep quality and aspects related to mental health before and after the training program Anthropometric measurements before and after the training program
E14	Teixeira-da-Costa, et al. [25]	Portugal	Identify and describe practices related to the consumption of tobacco products and their distribution according to gender among students at a Portuguese university	University students from the university of Algarve	Application of a questionnaire on tobacco consumption and analysis of the data collected

to describe the associations between health, perceived wellbeing, and personal health-promoting resources. The data revealed that students had good health and wellbeing, with low levels of alcohol and recreational substance use, good dietary habits, regular physical activity, and a strong perception and knowledge of personal health promotion. However, the data indicated that 40% of students had difficulties maintaining good sleep habits.

Regarding physical activity and wellbeing, study E13 stands out for analyzing a physical activity program and its outcomes. It serves as a test for developing a practical HP intervention. In this study, the researchers observed the effects of a physical training program on sedentary students at a Spanish university. This longitudinal study analyzed whether participation in the program influenced factors related to health and wellbeing among the participants. At the end of the study, improvements were observed in sleep quality, anxiety, and depression after 5 weeks of training, although the improvement in stress levels was not statistically significant.

In study E14, although it is also diagnostic research, it is part of an established program at the University of Algarve aimed at combating smoking. This intervention consists of institutional actions to raise awareness within the academic community about the harmful effects of smoking and focuses on the smoking cessation process. The program is developed in partnership with the Algarve Regional Health Administration and a food industry company. The study involves data collection to plan the continuation of interventions based on scientific evidence. A questionnaire was administered to the student body regarding their smoking habits. The results showed that among smokers, 45% reported smoking daily while 55% considered themselves occasional smokers, with no significant difference between men and women. The data also indicate that female smokers prefer conventional cigarettes, whereas men consume more tobacco/nicotine products. These findings may provide guidance for future HP actions for the studied population.

Regarding diagnostic research focused on the student population, study E9 describes the authors' successful experiences in conducting health research within HEIs. The goal of the research was to foster a discussion platform among researchers, which aligns with one of the aspects of the HPU

model: mutual collaboration in developing actions. In this study, the investigators reported their experience with data collection interviews in the university population and found that women, in general, are more inclined to respond to questionnaires than men. This finding suggests the need for efforts to encourage greater participation from men in future research.

Analyzing the topics more broadly, it is evident that most actions focused on the perception of gender differences in maintaining healthy habits (28.6%). The studies analyzed concluded that the female population pays more attention to health. Sleep quality and smoking were the subjects of 21.4% of the studies, while alcohol and recreational substances were the focus of 14.3% of the investigated studies. **Table 2** presents the main topics worked in HP actions.

Institutional Diagnostic Studies

These investigations are focused on HEIs, their leaders and how they perceive PdS and how the different sectors act or organize themselves to promote health in the institution (E1, E5, E7 and E12). It is also interesting to highlight that E1 and E5 are the studies in our sample with a qualitative approach. E1 investigated how the concept of a healthy university is operationalized in a HEI that has a salutogenic approach and another university that does not have this approach in its organizational policy. It is an “instrumental case study” type study, in which an “exemplary case” and an “opposite case” were analyzed. At the university with a salutogenic approach, one of the main characteristics observed was the notion that the health and wellbeing of the academic community impact the development of the institution, both being interconnected. Thus, a strong tendency to value the individual was observed in this HEI, with the development of democratic processes for building actions and efficient channels of communication between students, employees and managers so that everyone could feel that their voice is valued and considered in the preparation of institutional policies and actions.

Study E5 deals with qualitative interpretative research. Although part of the research focused on data mining among the immigrant university public, we observed that the main focus was the perception of this public and the directors of the HEI studied about the health and wellbeing sector that serves the

TABLE 2 | Topics covered in HP actions. (Integrative review, countries belonging to the European Union and England, 2014–2023).

Types of researches	Topics	f (%)	Studies
Diagnostic studies in the student population	Gender differences in maintaining healthy habits	4 (28.6)	E2, E3, E4, E9, E14
	Smoking	3 (21.4)	E2, E3, E14
	Alcohol and recreational substances	2 (14.3)	E3, E4
	Sleep quality	2 (14.3)	E10, E13
	Overweight	1 (7)	E4
Institutional diagnostic studies	Health promotion concept	1 (7)	E1
	Offer of health services	1 (7)	E5
	Mental Health	1 (7)	E5
	Healthy HEIs network	1 (7)	E7
	Nutrition	1 (7)	E12
Research based on reports of Health promotion actions	Health education	2 (14.3)	E6, E8
	Interinstitutional partnerships	1 (7)	E6
	Worker health	1 (7)	E11
	Psychosocial health	1 (7)	E8

f = Absolute frequency and percentage.

student population. The article also analyzed the organizational barriers perceived by immigrant students that impede their academic success. Using photovoice methodology, combined with narrative interpretation, ten refugee university students report aspects that influenced their mental health and wellbeing, including elements related to the university where they study. Semi-structured interviews were carried out with professionals and academics who could somehow influence the health and wellbeing of refugee students. The results reveal that these students have some difficulty accessing the HEI's health and wellbeing services. According to the research, this fact is the result of several factors, such as lack of knowledge about the service offered, the fear of stigma for seeking help and the discomfort of talking to a stranger about "their personal stories".

Finally, some students report difficulties in developing trust in the university's health and wellness sector, arguing that there is a lack of diversity among the professionals in the sector, with the majority being Caucasian. From the students' perspective, the lack of diversity among the staff hinders the development of empathy for their life stories and the quality of care. Key informants, in turn, confirm the students' lack of awareness of the service, as well as recognizing structural and resource deficiencies in the health and wellness sector. Both groups contributed suggestions for possible changes and improvements to the sector, such as increasing awareness of the service's existence and enhancing the representativeness of the professionals who serve the students, in addition to training them in managing typical traumatic situations faced by refugee students.

Study E7 analyzed the HPU's network in Germany, identifying key agents within institutions and the extent to which there was coordination to achieve the goal of promoting health within the academic community and its surroundings. The study focused on identifying key agents in the network and analyzed the level of interaction between these individuals. The research was conducted via a questionnaire distributed to 33 selected participants, representatives of 33 organizational units that are part of the network. The results show good interaction among

network agents, with effective information flow and close communication levels between the analyzed network agents. It was also noted that, among the health promotion topics each agent considers important for their professional quality, physical activity and relaxation were among the most frequently mentioned. This suggests that these topics are valued in institutions that adhere to health promotion practices.

Concluding the analysis of diagnostic study articles, E12 examined the food services sector in two universities, one located in northern Portugal and the other in Spain. The food handlers responsible for meals in the cafeterias and restaurants of these institutions were subjected to a questionnaire. The aim was to understand how they manage salt in the food prepared for the academic community. The results showed that food handlers perceive that the population in both countries consumes excessive salt and that there is a real need to reduce salt in the meals prepared in higher education institutions. However, the study reports difficulties in reducing salt use in prepared food, citing consumer opinions and the fear of losing customers due to the belief that the food will be less flavorful. These results may assist in the development of interventions in the field of nutritional education for the university community.

Research Based on Reports of Health Promotion Actions

We classify the second group of studies as "studies describing actions in HP" based on Suárez-Reyes and Van den Broucke [26]. In their study, they classify this type of study as "intervention studies."

The articles belonging to the second category (E6, E8, and E11) describe actions or programs related to HPU.

E6 outlines the trajectory of the Andalusian Network of Healthy Universities (RAUS) and its health promotion activities at Pablo de Olavide University. It details various partnerships, including those with the Regional Ministry of Health, the Andalusian regional government, and UNESCO, as well as other institutions such as

hospitals, banks, and health-related companies. The article also reports on several events organized for the student body, university professionals, and the external community, including World Health Day, World AIDS Day, lectures on dietary habits, health, society and education, affective-sexual education, meditation, and eating disorders.

Additionally, roundtables were conducted with professionals on topics such as youth and health, Mediterranean diet, and therapy. Health multiplier training sessions were organized to disseminate knowledge among the youth both within and outside the university. The study also reports on alternative health and wellness campaigns developed by students. The RAUS exhibits actions that are closely aligned with the HPU movement. It is evident that various sectors within the institutions are involved in the development of these actions and the democratic decision-making process. The article reflects on the significance of universities embracing their social role in producing and disseminating scientific knowledge for the health and wellbeing of the general population and underscores the importance of the HPU movement.

Article E11 is one of the studies that describes a practical action in health promotion and is the only one in the sample that specifically targets staff within higher education institutions (HEIs). The aim of the work was to outline the research phase and the implementation of an occupational health plan at a Portuguese university. The University of Aveiro serves as the incubator for this program, but the proposal is to adapt and apply the experience to any type of organization.

The plan consists of the implementation of the “Integrated Electronic Health Monitoring System for Health Management in Universities” (e.cuidHaMuSTM). The proposal is based on three phases: awareness, motivation, and action. The program focuses on two main functions. The first is health monitoring through screening and prospective surveillance via an online platform. The second function involves intervention in avoidable non-communicable diseases through individual health records of workers. A pilot test was conducted using a short questionnaire administered to workers who were called to the university’s health department for their annual medical check-up, achieving a 93% participation rate among the targeted staff.

The data revealed a low level of physical activity and issues with non-communicable diseases. The results are intended to assist in building a culture of health promotion in the context of occupational health within HEIs. This way, health data of a specific organizational group can inform decision-making sectors both within and outside the institution, facilitating evidence-based actions and public policies. Simultaneously, the program is a collaborative approach to health promotion, being self-administered and optional.

Concluding the category of practical actions in health promotion, Article E8 describes an initiative at an Austrian university that focuses on social skills and the sense of coherence related to the health of first-year students in health and social care courses. The study details important stages of health promotion interventions, such as the data collection phase conducted collaboratively with students through questionnaires and “Open Space” sessions, where students reported factors influencing their health during their first year of higher education.

The study also presents the implementation phase of the program developed from the collected data, titled “Healthy Study Start,” aimed at first-year students. This program includes informational sessions on health, wellbeing, and social skills, interactive activities among students, and teamwork exercises outdoors. It is important to note that this study is the only one that addressed students with physical disabilities, mentioning that the program and its evaluation are adapted to support inclusion. Finally, the article describes the evaluation of the intervention by the target audience. The results indicate that the action improved management skills, social support awareness, friendliness, and effectiveness related to teamwork among participants. This suggests that health promotion actions at the start of university life can support the development of social qualities, which may contribute to the promotion of student wellbeing throughout their academic journey.

In the present integrative literature review, a higher number of diagnostic studies in HP were observed in the scientific literature, aimed at developing actions based on perceived needs (articles E1, E2, E3, E4, E5, E7, E8, E10, E12, E13, and E14). These results corroborate what was proposed in the Okanagan Charter, which states that HP research is one of the listed actions most related to the university [7]. In our study noting that there is significantly more published information in the scientific literature from diagnostic studies, whether targeting specific audiences or institutional, than in descriptions of proposed interventions or actions that have already been concretely implemented. This is related to the fact that research is one of the missions of universities, which means that these institutions already have resources and qualified professionals for this purpose.

Ferreira et al. [27], in their integrative review of articles describing HP actions in HPUs, found various concrete actions described in 17 selected articles. However, their research was not restricted to the European Union (EU), but analyzed universities across different continents. The present literature review focused on HEIs in the EU, as it was understood that the countries in this continent share certain cultural and social context similarities. Additionally, it is important to note that the selected articles were published from 2016 onwards. Therefore, even though England is no longer part of the EU, it was deemed appropriate to include it in our sample, given that their exit from the European bloc was only finalized in 2020.

The reason for the chronological criterion is that the Okanagan Charter, which is our guiding document for analysis, was published in 2015. This document provides a guide for developing health promotion interventions in universities according to the principles of the HPU movement. One of the key principles is the promotion of research to enhance knowledge about the health of the university community. This is essential for developing evidence-based actions and projects. In this context, diagnostic studies align with this principle; however, it is important to emphasize that the diversity of the audience needs to be addressed.

One of the premises of health promotion in HEIs is the focus on all sectors of the HEI, including students, professionals, and the external public [28]. In the present literature review, it was observed that most investigations focus exclusively on the

student population (E2, E3, E4, E8, E13, and E14), comprising 50% of the analyzed studies. This indicates a gap in research, whether diagnostic or experiential, that is directed towards professionals in health-promoting HEIs.

When referring to the community outside of institutions, this gap is even more pronounced. Study E10 was the only one that focused exclusively on the health of staff, as the presented health monitoring program initially targeted HEI professionals. While directing actions toward students is fundamental, it is important to emphasize that the health of staff and the external community of HEIs are also central to the HPU movement [29]. According to Arroyo [30], HPUs should be committed to developing a culture of health promotion within the entire academic community as well as in the external community, that is, in society at large. Society and universities are closely linked, and the knowledge produced within universities should find ways to reach the surrounding community [31].

The concern for environmental quality is also highlighted in E6. The research discusses the need for an approach that promotes environmental health and sustainability in spaces. The dimension of environmental health in health-promoting spaces, as this aspect can positively influence individuals' daily lives [32].

Hof-Nahor and Biswas [33] report how a university in Israel has increased the use of green spaces for hosting events with students and staff, with the aim of fostering a culture that values environmental quality within the academic community. It is well established that green spaces contribute to the wellbeing of individuals who frequent these areas [34]. Evidence indicates that vegetated areas have the potential to reduce stress, promote an effective learning environment, and enhance cognition among students [35]. The Okanagan Charter includes as one of its principles the need to integrate health, wellbeing, and sustainable development. Furthermore, according to Arroyo [16], "HPUs have the mission to advocate for health using the conceptual/operational framework of social determinants of health and the Sustainable Development Goals (SDGs)."

Finally, E8 addresses the aspect of social relations and cooperation within the academic sphere, which are important elements for health and wellbeing. The study engages with the concept of "sense of coherence" developed by Antonovsky, who asserts that health is achieved through individuals' personal resources, including psychosocial elements [36]. Social competencies, as well as a sense of empathy and collaboration, should be strengthened among individuals. These factors are crucial for maintaining psychosocial health. The approach implemented in the study facilitates interaction among students, enabling the development of connections between them, which fosters a sense of belonging to the group, improving partnership and solidarity. These elements contribute to developing an identification with the university, which undoubtedly enhances a socially healthier academic environment [37].

Human beings are inherently social and social skills are crucial for their personal and professional development. The Okanagan Charter includes as one of its principles the establishment of interpersonal and intersectoral connections

for creating healthy environments, highlighting the importance of this issue for people's wellbeing. It is essential that health be viewed beyond the health-disease binary, and HP actions should also consider a wide range of issues to address the entirety of an individual's life.

HEIs have increasingly been established as favorable environments for HP in various countries. Although research in this area is expanding, it is necessary for the principles of the HPU movement to be disseminated widely, becoming familiar to all stakeholders. This can more easily lead to the development of more effective HP actions targeted at the entire academic community and those outside the institutions. It is also essential to develop and strengthen actions and research concerning health and environmental sustainability, as well as psychosocial health and wellbeing within the framework of HPUs.

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ML contributed as first author through research and analysis of data and conclusions. JC and JB equally contributed with corrections to the analyzes and with additional contributions on the state of the art on the subject. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.ssph-journal.org/articles/10.3389/phrs.2025.1608126/full#supplementary-material>

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