

Building an interdisciplinary workforce for prevention and control of non-communicable diseases: the role of e-learning

Svetlana Akselrod and colleagues argue that interdisciplinary education for health workers, including through e-learning programmes, can help improve the quality of integrated care for non-communicable diseases

Non-communicable diseases (NCDs), including cardiovascular diseases, cancers, chronic respiratory diseases, diabetes, and mental health conditions, are a threat to human health, causing 74% of global deaths annually.¹ Three quarters of these deaths occur in low and middle income countries, where health systems are least prepared to deal with the growing burden of chronic disease. NCDs represent a complex interplay of genetic, behavioural, social, economic, cultural, environmental, and commercial factors.¹ The convergence of the growing NCD burden, multimorbidities, and rapid technological advances calls for integrated models of chronic care that include interventions and services for health promotion, disease prevention, diagnosis, treatment, rehabilitation, and palliative care.²⁻⁴

To provide such a broad range of interventions, especially when faced with weak and fragmented health systems in resource poor settings, it is important to strengthen the capacities of the existing health workforce and train additional interdisciplinary staff and equip them with the unique skills required to prevent and manage NCDs.^{2-5,9} However, concern is growing that education programmes have not kept pace with the changing demographic and epidemiological trends or the need for integrated delivery of services by interdisciplinary teams.

We argue more must be done to tackle the challenge of building an interdisciplinary health workforce for the prevention and control of NCDs. Current health workforce constraints may threaten the provision of good quality integrated care for NCDs and we need to rethink education for an interdisciplinary NCD workforce in response. Online learning, with a focus on continuing professional development, presents an opportunity to start to tackle this education gap.

Challenges to building an interdisciplinary workforce

Important barriers may impede the delivery of integrated health services, including governance and operational difficulties, weak regulatory capacities, unclear financial responsibilities, and other barriers related to the context, health system, socioeconomic environment, and culture.^{2,10} While these system level challenges can affect the availability, accessibility, and affordability of integrated care for NCDs, we focus on challenges with the health workforce that affect the quality of services.

Health workforce shortages and maldistribution

Shortages of health workers and an inadequate skills mix—different types of staff in a team or healthcare setting¹¹—limit

access to essential healthcare and threaten the implementation of integrated care for NCDs. According to the World Health Organization's assessment of the health workforce for the year 2020, the world lacks 15 million health workers, with the greatest shortages experienced by the WHO African, Eastern Mediterranean, and South-East Asian regions. This number is expected to increase to 18 million by 2030.^{12,13} A 2022 systematic analysis for the Global Burden of Disease study 2019 based on data from 2000 to 2019 highlighted an even larger gap in the global health workforce of more than 43 million health workers, including 6.4 million physicians, 30.6 million nurses and midwives, 3.3 million dentistry personnel, and 2.9 million pharmaceutical personnel.¹⁴ Despite the variation in estimates because of methodological differences, the global health workforce shortages are a threat to achieving universal health coverage and the Sustainable Development Goals (SDGs).^{2,10,14-17}

The shortage of health workers is further compounded by their uneven distribution across geographical regions. For example, the density of physicians in central Europe, eastern Europe, and central Asia is 38.3 per 10 000 population, more than twice the global average of 16.7 per 10 000 and 13 times higher than in sub-Saharan Africa.¹⁴ Similar disparities apply to the density of nurses and midwives, estimated at 73.5 per 10 000 population in central Europe, eastern Europe, and central Asia, compared with 9.7 per 10 000 in South Asia.¹⁴ Disparities also exist within countries, with a greater concentration of health workers in urban areas.^{2,10,14-17}

Medical schools and other healthcare training institutions are also unequally distributed across the world. For example, according to the World Directory of Medical Schools, about 3300 recognised medical schools exist globally, with 530 in India, followed by Brazil (332), the USA

KEY MESSAGES

- Effective and efficient pre-service and continuing professional education are needed to prepare an interdisciplinary health workforce for the prevention and control of NCDs
- Collaborative practice and interdisciplinary education can help health workers to integrate NCDs into routine care and improve the quality and efficiency of services, but they are often not integrated into educational and clinical settings
- Well designed e-learning programmes, supported with evidence of their effectiveness and acceptability, can increase access to good quality education worldwide
- Comprehensive evaluations of e-learning programmes is needed to understand the effect of e-learning on health worker competencies and the quality of integrated care

(195), and China (164).¹⁸ Together, these four countries account for one third of all medical schools globally, while many countries in sub-Saharan Africa have either no medical school or only one.¹⁹ Countries that lack training facilities are less likely to have adequate numbers of healthcare professionals in the workforce.

NCD education and competencies

The knowledge of NCD-related issues, even among highly educated health workers, is still often inadequate, particularly in low and middle income countries.^{10 20 21} Evidence shows that the health workforce is often not equipped with the necessary skills to work across specialties and levels, and along a continuum of care, for the provision of integrated care.²² The ability to work in interdisciplinary teams is essential to the delivery of good quality integrated NCD services.^{23 24} However, building effective interdisciplinary teams can be challenging. Tensions between occupational groups and specialties can arise because of misalignment of priorities and professional values, lack of trust, and concerns about one's roles being taken by others.²⁵ As a result, healthcare teams can revert to profession based teams rather than more patient centred ones.⁵ Lack of incentives and support systems for health workers to deliver integrated health services, especially in low and middle income countries, can result in reduced motivation and low confidence, and in turn affect health worker performance.^{10 20 21 26}

Rethinking education and training needs

Collaborative practice and interdisciplinary education have long been considered best practices for supporting health workers to integrate NCDs into routine health services to improve the quality and efficiency of these services. Despite this evidence, col-

laborative practice and interdisciplinary education are often not implemented in clinical settings.^{2 15 22 27} WHO has identified six competency domains for health workers that are essential for the provision of good quality integrated care and the achievement of universal health coverage (**box 1**).²⁸

When health workers are provided with opportunities to train within interdisciplinary teams in clinical settings and can benefit from multidisciplinary education, they are more likely to implement interdisciplinary approaches in the workplace. This can in turn contribute to improvements in the quality of services provided and patient outcomes.²⁹ Examples of such interdisciplinary training are the paediatric advanced life support and adult advanced cardiovascular support courses offered by the American Heart Association, where different health professionals engaged in responding to cardiovascular and respiratory emergencies take part in clinical scenarios and simulations that require them to collaborate with colleagues to assess and treat patients.³⁰

Moreover, interdisciplinary education has the potential to strengthen health workers' leadership, communication, problem solving, and critical thinking abilities. Such education also prepares them for working in interdisciplinary teams by enhancing mutual accountability, consolidating interprofessional relationships, and promoting a patient centred approach in clinical practice.⁷ However, education systems in most countries are ill prepared for interdisciplinary learning based on non-traditional teaching methods which break down professional silos and smooth the transition from training to interdisciplinary clinical practice. Interdisciplinary learning is still not integrated into pre-service education and post-qualifying education,

including continuing professional development programmes or within health workforce planning policies and strategies.³¹

Sustainable investment in interdisciplinary education of the health workforce is crucial to building the skills and capacities of the NCD workforce. Improving access to knowledge is an important step, and interest is growing in technological advances for interdisciplinary learning for prospective and existing health workers and the development of their collaborative competencies.^{31 32}

Role of e-learning in continuing professional development

Recent digital developments are revolutionising the way lifelong learning is provided. E-learning—the use of information and communications technology for education and training—for continuing health workforce education is growing in popularity globally, particularly in the context of the covid-19 pandemic, and most participants have been satisfied with the experience.^{11 33} WHO considers that e-learning is likely to be as effective as traditional health workforce education and that participants acquire knowledge and skills through e-learning just as well as through traditional teaching.³⁴

E-learning increases access to education worldwide, including in geographically isolated locations or those with insufficient local training institutions.^{11 35} Health workers in rural communities often have limited access to continuing professional development opportunities, such as on topics related to mental health. Online programmes have been successfully used to deliver this continuing education to healthcare workers in both developed and low resource settings where the necessary technologies are available,^{11 36} with high

Box 1: Competency domains for health workers essential for the delivery of good quality integrated care

- *People centredness*—The ability to provide integrated health services that incorporate the perspectives of individuals, caregivers, families, and communities as participants in and beneficiaries of health systems, along a continuum of care and over the life course.
- *Decision making*—The ability to take an adaptive, solution oriented, collaborative, and rigorous approach to decision making, based on systems thinking and problem solving.
- *Communication*—The ability to proactively manage interactions with others, including active listening and adapting language to the audience, goals, needs, urgency, and sensitivity of the interaction.
- *Collaboration*—The ability to engage in collaborative practice and work effectively within interdisciplinary teams, demonstrating the capacity to: build and maintain trusting relationships; learn from, with, and about others; and manage conflicts.
- *Evidence informed practice*—The ability to adapt the clinical practice to the best available evidence, and to assess and continually improve the services delivered based on new knowledge and skills acquired, by contributing to a culture of safety and ongoing quality improvement.
- *Personal conduct*—A series of self-governed behaviours, comprising working within the limits of competence and scope of practice; demonstrating high standards of ethical conduct; engaging in lifelong learning; and managing own health and wellbeing.

Source: WHO, 2022.²⁸

Table 1 | Advantages and challenges of online continuing professional development programmes

Advantages	Description
Cost effectiveness	E-learning allows better use to be made of existing educational resources and the delivery of good quality content while working around outdated practices in training institutions and responding to the growing need for change in the field of health workforce education. ^{11 40}
“Just-for-you” learning	Learning programmes can be customised to the needs of individual participants, who can access a wide range of education resources and can select and use them in the manner best suited to their own learning goals and interests. ³⁵
“Just-in-time” learning	Learning programmes make educational resources available to participants whenever they need them. ⁴⁰
On-the-job learning	Learning programmes can be delivered on site (ie, within health facilities). On-the-job learning promotes the integration of theory and practice and makes continuing professional development programmes more educationally effective and relevant to health workers’ day-to-day clinical practice. ^{35 40 41}
Globalisation of health workforce education	E-learning can help standardise health workforce education across countries and overcome differences, by making content universally available. It can also promote the development of “international learners” by facilitating collaboration between health workers across the globe. ⁴²
Self directed learning	Online programmes for continuing professional development allow health workers to complete the training at a self directed pace. ^{35 43-45} These programmes overcome one of the most commonly reported challenges among health workers which is the lack of time to engage in continuing professional development while working full time. ^{35 46}
Improved digital literacy	E-learning can help build digital competency among health workers by enhancing their understanding of how information and communications technology can be used to improve access to and quality of healthcare services ¹¹
Challenges	
Acceptability among health workers	The success of online programmes for continuing professional development depends on several factors, including the extent to which health workers embrace new technologies and their level of digital literacy. ^{47 48} For instance, participants who are not familiar with the technologies used for the course will likely not engage in or complete the training, unless they receive adequate support and technical assistance ³⁵
Technological challenges	Technological challenges, such as access to the necessary equipment (eg, computers, handsets, and tablets), and sound and network quality are among the main barriers to completing online programmes for continuing professional development, especially in low and middle income countries and rural areas. ^{35 49} Potential solutions to technological challenges, which disproportionately affect women, include the use of radios as an alternative to the internet or mobile telephones, or the provision of devices for educational purposes.
Insufficient financial resources	The lack of funding to develop and implement e-learning programmes is an important barrier in many countries. ¹¹ Thus, new models of funding online programmes for continuing professional development need to be developed. ^{47 48}
Poor evaluation methods	Most online programmes for continuing professional development have not been evaluated or have only been evaluated by assessing participant engagement, satisfaction, and educational outcomes. Assessments of transfer of learning to practice and the effect on health outcomes are largely absent. ⁵⁰ Hence, more thorough evaluation and longitudinal analyses of the content areas and activities in programmes for continuing professional development are needed, as well as economic evaluations. ^{36 51 52}
Assessment of achievement of learning objectives and educational outcomes	While participants’ newly acquired knowledge and skills can be evaluated through online platforms, clinical competence can only be assessed in person. Competency based education has a whole of programme approach to learning and assessment. The method of assessment (eg, online versus face to face) must be appropriate for the educational outcomes being assessed. ²⁸
Inadequate standards and formal certification	Standards of quality for online programmes for continuing professional development must be developed based on widely agreed best practices and the latest available evidence. In addition, formally certified courses are needed. ^{35 53 54}

levels of satisfaction among participants, increased awareness of mental health issues, and greater confidence in mental health interventions.^{37 38}

When designed appropriately, e-learning offers individualised approaches to

education for both self learning and facilitated group learning delivered in a blended format. The use of e-learning technologies such as discussion forums and online platforms for facilitated peer learning could also improve the

quality of interdisciplinary, collaborative learning and encourage interprofessional interactions.³⁹ Although online continuing education has several advantages, successful implementation also has challenges (table 1).

Box 2: Role of professional associations in innovative learning solutions

Multidrug-resistant tuberculosis (TB) is increasingly a global problem, and it is particularly challenging to treat in resource poor settings where most cases occur. To improve the quality of care for TB the World Medical Association, in collaboration with WHO and the Global Tuberculosis Institute of the State University of New Jersey, and supported by the Eli Lilly TB Partnership,⁵⁵ launched a refresher course as a free online tool for physicians to learn and test their knowledge on TB.

The course aims to assist doctors in delivering high quality, effective care when diagnosing, treating, and managing patients with TB. Although the course is mainly aimed at doctors, it may also be useful for nurses and other members of the healthcare team.

The course is based on the International Standards for Tuberculosis Care (ISTC). The ISTC provides a set of widely accepted, evidence based standards that all clinicians should seek to achieve. The course offers clinical care information on TB including diagnostics, treatment regimens, and management of multidrug-resistant TB. It also includes sections on patient-clinician interaction, how to ensure patient adherence to treatment, and infection control. The general principles and standards emphasised in the course are intended for use in different countries and regions.

High user satisfaction with the course led the World Medical Association to launch a new application for tablet computers that will allow doctors to access the course offline. The convenience of access to learning resources everywhere and at any time provides doctors with the opportunity to improve the quality of care they deliver and achieve better health outcomes for their patients. The course has been translated into other languages and is accredited by the Norwegian Medical Association. Based on the initial feedback from members of the World Medical Association, the course has already contributed to the improvement in the quality of care processes, but further evaluation will be required to document the improved health outcomes.

Box 2 outlines a successful example of the implementation of online training courses for the health workforce which illustrates the potential of e-learning to improve access to and the quality of health workforce education.

When designing programmes for continuing professional development and choosing delivery methods, due consideration should be given to equity. For example: a wide and varied cross section of the health workforce should be included; content should be provided in multiple languages (in low and middle income countries sufficient content is lacking in Arabic, French, and Spanish as compared with English); barriers to access should be tackled, including narrowing the digital divide between high and low and middle income countries, and within countries; and the participation of women and other under-represented groups should be encouraged.³⁵

The delivery method should also be selected based on the type and complexity of the content, the skills, goals, and experiences of the intended audience, and the availability of resources.³⁵ For example, self directed learning allows participants to choose when and how to engage with the training material and tailor their learning experience to their needs, time constraints, and learning objectives.³⁵ The combination of online and face-to-face methods allows participants to enjoy the flexibility of e-learning while being able to collaborate with colleagues in person.^{35,56} However, this blended approach to learning is not always possible because of resource, logistical, and time constraints, in which case fully online training programmes are a valuable solution.

Finally, organisational cultures that promote the continuous development of staff and provide adequate support—including funding for courses, designated time for training during work hours, and use of office equipment—are essential to enable health workers to engage in programmes for continuing professional development.^{35,57} Supportive organisational environments will help managers to see the value of continuing education as part of the responsibilities of health workers' jobs, rather than as a burdensome additional task.^{35,58} An effective strategy to incentivise both health workers and their managers is to offer recognised certification upon completion of programmes for continuing professional development.⁵⁹

Conclusion

Integrated care has great potential to tackle the growing burden of NCDs. Yet, the severe

shortage and inadequate skill mix of the healthcare workforce hamper the delivery of continuous, well coordinated care that is responsive to population needs. The effectiveness and efficiency of pre-service and continuing professional education need to be improved to build an interdisciplinary NCD health workforce that is knowledgeable about population based interventions, not just disease specific services.

Online innovative teaching methods and platforms are crucial to fill gaps in access to and quality of education for the healthcare workforce. However, to increase the uptake and effectiveness of e-learning programmes, the challenges of feasibility, usability, and acceptability need to be overcome. Well constructed evaluations that go beyond participant feedback will be required, particularly in low and middle income countries, to understand the effect of online courses on learning outcomes and, ultimately, the quality of integrated care. At the health system level, changes in health workforce policies and practices should move away from stand alone or vertical NCD interventions towards more comprehensive approaches with investment in the integration of NCDs into other programmatic areas (eg, maternal and child health care and HIV) and delivery platforms as part of countries' efforts towards universal health coverage.

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Svetlana Akselrod, director¹

Téa E Collins, lead²

Connie Hoe, assistant professor³

Julia Seyer, senior medical adviser⁴

Kate Tulenko, consultant⁵

Flaminia Ortenzi, consultant⁵

Daria Berlina, technical officer⁶

Howard Sobel, WHO representative⁷

¹Global NCD Platform, World Health Organization, Geneva, Switzerland

²Global NCD Platform, World Health Organization, Geneva, Switzerland

³Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

⁴World Medical Association, Ferney-Voltaire, France

⁵Global NCD Platform, World Health Organization, Geneva, Switzerland

⁶Global NCD Platform, World Health Organization, Geneva, Switzerland

⁷Maternal Child Health and Quality Safety, World Health Organization Regional Office for the Western Pacific, Manila, Philippines

Correspondence to: T E Collins
collinst@who.int



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