

Outcomes of digital training for community health workers in Low- and Middle-Income Countries: a scoping review

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Abstract

Background: Community health workers (CHWs) play an important role in delivering essential health services in low- and middle-income countries (LMICs). Training CHWs using digital approaches is on the rise. However, important questions remain about digital training optimization and outcomes.

Objective: This review describes the characteristics of digital training for CHWs and their impact on health services in LMICs.

Methods: A scoping review approach based on Arksey and O'Malley's guiding principles was used to retrieve, review, and analyze existing literature. We searched ten foremost databases using keywords and Medical Subject Headings terms for CHWs, LMIC, and digital learning to identify primary, peer-reviewed studies published through November 2024. Articles that focused on the provision of digital training for CHWs working in LMICs in any disease domain evaluating a learning, implementation, or clinical outcome met the inclusion criteria. Study details, study designs, training attributes, technology and CHW descriptions, and outcomes were abstracted. The PRISMA guidelines for reporting scoping reviews were used.

Results: A total of 699 articles were retrieved and screened for eligibility, of which 18 original articles met the inclusion criteria. Most (n=13) were conducted in Asia. Most (n=15) used non-randomized study designs. The most common attributes included: synchronous (n=8), accessible in the community (n=12), use of smartphones (n=7) and training videos (n=14), and accessible online (n=9). Majority reported learning outcomes (n=14), half reported implementation outcomes (n=9), and only one reported clinical outcomes (n=1). The learning outcomes focused on knowledge gained and were mostly positive. The implementation outcomes included CHW's acceptability and feasibility to use the digital training approach. The clinical outcome was effectiveness.

Conclusions: Few identified studies met eligibility for inclusion. Majority of the studies were positive, focused on knowledge gained but non-randomized and failed to evaluate implementation or clinical outcomes. Further research should use rigorous designs to focus on implementation and clinical outcomes to ensure that a better understanding of whether and how to use digital learning for these CHWs in LMIC.

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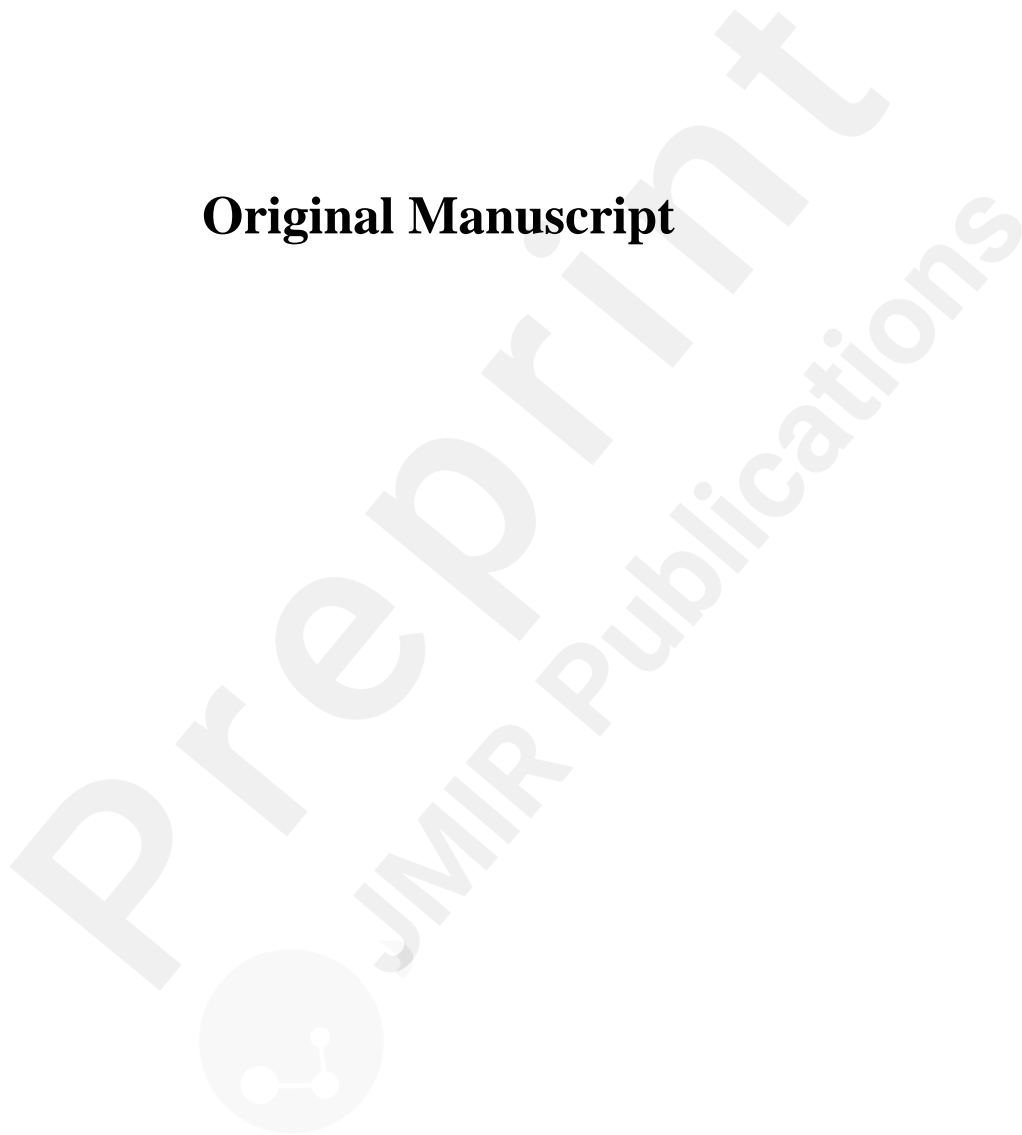
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Abstract

Background

Community health workers (CHWs) play an important role in delivering essential health services in low- and middle-income countries (LMICs). Training CHWs using digital approaches is on the rise. However, important questions remain about digital training optimization and outcomes. This review describes the characteristics of digital training for CHWs and their impact on health services in LMICs.

Methods

A scoping review approach based on Arksey and O'Malley's guiding principles was used to retrieve, review, and analyze existing literature. We searched ten foremost databases using keywords and Medical Subject Headings terms for CHWs, LMIC, and digital learning to identify primary, peer-reviewed studies published through November 2024. Articles that focused on the provision of digital training for CHWs working in LMICs in any disease domain evaluating a learning, implementation, or clinical outcome met the inclusion criteria. Study details, study designs, training attributes, technology and CHW descriptions, and outcomes were abstracted. The PRISMA guidelines for reporting scoping reviews were used.

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online (n=9). Majority reported learning outcomes (n=14), half reported implementation outcomes (n=9), and only one reported clinical outcomes (n=1). The learning outcomes focused on knowledge gained and were mostly positive. The implementation outcomes included CHW's acceptability and feasibility to use the digital training approach. The clinical outcome was effectiveness.

Conclusions

Few identified studies met eligibility for inclusion. Majority of the studies were positive, focused on knowledge gained but non-randomized and failed to evaluate implementation or clinical outcomes. Further research should use rigorous designs to focus on implementation and clinical outcomes to ensure that a better understanding of whether and how to use digital learning for these CHWs in LMIC.

Key words: Community health worker, digital training, blended learning, eLearning, LMIC, lay health worker

Introduction

Low and middle-income countries (LMICs) face a shortage of professional health care workers (HCW) [1]. To overcome this gap, lay HCWs or community health workers (CHWs) have been recruited and trained to carry out an increasing array of tasks [2]. CHWs are lay people working within their own community performing functions related to healthcare delivery and health promotion, but have not received a formal professional or paraprofessional certificates or degrees [3]. CHWs are often trained for specific tasks such as HIV testing, disease screening, or provision of immunization and have been recognized as critical role-players within the primary healthcare setting, [4] where task shifting to CHWs has been shown to be cost-effective method of service delivery scale-up [5, 6]. When provided with the correct resources, training and support, CHWs have improved accessibility to basic health services resulting in better health outcomes [7, 8].

The World Health Organization (WHO) recommends that CHWs receive regular training and supervision to fulfil their roles successfully [9]. To increase the competency of CHWs in healthcare provision, there is a need for more effective, greater quality and easily accessible health training. The design of these training approaches would ideally also minimize the burden on an already strained healthcare systems by limiting the time CHWs spend away from workstations while attending training required to improve service delivery.

The use of digital technology in CHW education may help in overcoming these challenges. Digital training may provide more accessible, standardized, relevant, timely, and affordable

solutions [10, 11]. Digital training by itself or in combination with face-to-face classroom training (i.e., blended learning) has been utilized for medical education in a variety of settings [6, 9, 12-14]. In addition, the SARS-CoV-2 (COVID-19) pandemic necessitated and reinforced the practice of digital training for lay cadres. However, the evidence around these trainings has not yet been synthesized.

Given that there are over eight million CHWs in LMIC [15, 16] globally, ensuring that they all receive optimal and appropriate training efficiently and cost-effectively is a challenge but also critical priority. Digital solutions may present a viable option given that digital training can be effective in high-income countries (HICs) with professional cadres. However, it is important to know whether these solutions can be applied to non-professional cadres and LMIC settings where there are limited digital skills and infrastructures [17, 18], and whether they will be found to be acceptable, feasible, and effective. To develop and implement successful digital training programs for CHWs in resource-constrained settings, a greater understanding is needed of the training attributes and the extent to which these training modalities enhance CHW capacity. The Kirkpatrick evaluation framework articulates four levels of training outcomes: 1) participant reaction to the training program experience; 2) learning outcomes; 3) participant's change in behavior; and 4) impact on clinical setting [19]. We undertook this scoping review with this framework in mind. This scoping review aimed to characterize and describe attributes of the digital and blended learning training for CHWs and their impact on learning, implementation and clinical outcomes in LMICs.

Methods

We conducted a scoping review in accordance with the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guidelines [20] on the provision of digital and blended learning training for CHWs in LMICs. Our scoping review followed systematic and transparent research steps guided by the framework described by Arksey and O'Malley [21] and updated by Levac et al [22], to characterize the attributes and nature of digital and blended learning training for CHWs in LMIC, as well as the outcomes considered.

Search strategy

The Cochrane Library and PROSPERO were searched to identify available or ongoing scoping and systematic reviews pertaining to the provision of digital or blended training for CHWs in LMICs. No previous or ongoing relevant reviews were identified.

We then designed a comprehensive search strategy to identify all relevant studies. A publication date limit was not set. Twenty relevant search terms for “Community Health Workers” and 21 search terms for “digital learning” and “blended learning” were developed. These were combined with the World Bank Group 2022 list of LMICs using Boolean operators to develop a master search query. Where appropriate, each index-linked Medical Subject Headings term was expanded to contain all relevant subheadings. In addition, synonyms were searched for each key term, along with wildcards and truncation for free-text words. The following databases were searched to identify primary, peer-reviewed studies published up to and including November 2024: Cumulated Index in Nursing and Allied Health Literature (CINAHL), Cochrane, Embase, Education Resources Information Center (ERIC), Global Health, Google Scholar, PsycINFO,

PubMed, Scopus and Social Science Research Network (SSRN). The search terms were adjusted accordingly for each database. A full record of the conducted search for each database is provided in the online supplementary material (Supplementary table 1).

Inclusion and exclusion criteria

Studies were included in the review if (1) primary participants were CHWs; (2) the training occurred in a country defined as an LMIC according to World Bank Group 2022 classification of economies [23]; (3) the CHWs were trained using digital or blended learning modalities; (4) primary data were collected; (5) primary focus of the training addressed a communicable or non-communicable disease domain; and (6) the article reported a learning, implementation, or clinical outcome. Digital learning was defined as a practice of learning using technologies [24, 25]. Blended learning was an education approach that combines face-to-face and digital learning approaches [26]. The training outcomes needed either to have been evaluated within the same group through pre-post-study design or with a control group through randomized or non-randomized controlled trials.

The scoping review did not restrict based on study design and included both qualitative and quantitative outcomes. Studies had to qualify as an original, full-text, research study to be considered for inclusion in the review. Review articles, commentaries, letters, policy briefs, protocols, needs assessments, and conference abstracts were excluded.

Outcomes

We assessed learning, implementation, or clinical outcomes. The learning outcomes included knowledge, attitudes and behaviors. Knowledge referred to information acquired through the training. Attitudes focused on confidence to perform tasks. Behaviors focused on whether trainees utilized what they learned. The implementation outcomes included acceptability, appropriateness, feasibility, and fidelity. Acceptability was defined as the CHW perception that the training approach was agreeable or satisfactory. Appropriateness was CHW perceived fit of the training. Feasibility was defined as the extent to which the training was successfully carried out in the setting. Fidelity was defined as the degree to which the training was delivered as intended. Clinical outcomes included how well the training improved patients' uptake in clinical practice [27].

Study selection

All articles identified via database searching and other methods including citation searching were exported into Endnote and imported into Covidence review software, and duplicate references were removed. Titles and abstracts of all the articles identified in the search were screened by two authors (TAT and FA) to determine whether they would be considered relevant for a full text review. The full text of all the articles identified as potentially relevant were then retrieved and reviewed in full against the inclusion and exclusion criteria by both reviewers. All articles that did not meet the eligibility criteria were excluded from the review database and reasons for exclusion were recorded. At all stages of the review, discrepancies between the authors were resolved via discussion. Where appropriate, the authors of individual papers were contacted for further information. References and other sources were reviewed to identify any other articles for full text review.

Data extraction

Data were independently extracted and tabulated by two authors (TAT and FA) using a data charting form in a Microsoft Excel spreadsheet. The use of a data charting form or table was recommended by Arksey and O'Malley and Levac et al [21, 22]. The data extraction form was piloted by two authors on five studies prior to use to ensure that all necessary data was captured appropriately. Where necessary, the corresponding authors for relevant studies were contacted via email to clarify aspects of their work prior to final extraction.

The bibliographic data extracted included the first author, title, year of publication, and country in which the study took place. CHW descriptions included CHW cadre name, number of CHWs trained, sex, age, education, disease domain, employment type (fulltime or part-time), duty station (community or facility-based), remuneration (presence or absence), and employer. Training features included type of training, modality, synchronicity, venue, device type, availability online or offline, technology medium, duration, number of sessions, and pedagogical approaches. Outcomes included measured, results, and limitations. The study design information was extracted and categorized into cross-sectional cohort, longitudinal cohort, quasi-experimental, and randomized controlled trials. The analytic approaches were classified into qualitative, quantitative, and mixed methods.

Once the data had been transferred into the spreadsheet, one author (TAT) reviewed the information and organized it into one of the following categories: 1) learning outcomes, 2)

implementation outcomes and 3) clinical outcomes. The descriptions of the included studies were analyzed and organized in tabular format, accompanied by a narrative summary.

Results

Search Results

The initial search of the 10 databases yielded 699 articles (see online Supplementary Table 2). After the exclusion of 135 duplicates, 564 papers were identified for initial screening. After title and abstract screening, 32 studies were identified for full-text review. An additional 13 articles were selected from reference lists and other sources, totaling 45 articles for full text review. After the full text review, 18 studies were identified for data extraction and 27 were excluded because they did not meet inclusion criteria. Reasons for exclusion at full-text screening can be found in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart (Figure 1).

Characteristics of included studies, CHWs and training

All 18 studies in this review were published from 2009-2024. A majority of studies were conducted in Asia (n=13), especially in India (n=8) [28-40], a few were conducted in Africa (n=5) [41-45], and one study was conducted in the Caribbean. None were conducted in Latin America, Eastern or Southern Europe, or Oceania (Figure 2). The countries where the studies were undertaken are summarized in Table 1.

Six different CHW terms were identified across the 18 studies, with variations being noted between studies in terms of CHW sex, type of employment contract, duty station, remuneration and employer. The terms 'community health worker' (n=9) and 'accredited social health activist' (n=5) were commonly used. 'Lay counsellor', 'primary counsellor', 'female community health volunteers' and 'acute care provider' were used in one study each. Majority of studies reported employing female CHWs only (n=11) and the others employed males and females. The age of CHWs varied from 18 to 54 years. Most CHW worked part-time (n=10); were community-based (n=14); were paid a monthly salary, incentive, or honorarium (n=14); and were employed by the government (n=15; Table 1).

A total of four study designs were identified. Studies were cross-sectional (n=9) [30, 32-35, 37, 39, 41, 43, 44], cohort (n=1) [41], quasi-experimental (n=5) [28, 29, 36, 40, 42] and randomized controlled trials (RCTs, n=3) [31, 38, 45]. With regard to the analytic approaches applied, most studies were quantitative (n=10) [32-35, 37, 38, 40-42, 45] and mixed methods (n=6) [28, 29, 36, 44]. Two used qualitative methods only [30, 43].

The training modalities described in the studies were digital learning (n=14) [28-38, 40, 41, 44, 45] and blended learning (n=4) [34, 37, 42, 43]. Some training approaches made use of tablets/smartphones (n=6) [31, 34, 35, 38, 41, 45]. This was followed by computers (n=5) [32, 34, 37, 39, 42] and basic/feature phones (n=1) [44]. There were some studies that reported the use of multiple technologies (n=5) [28-30, 33, 36]. The training approaches were all implemented by researchers (n=18) and supported by government (n=2) [41, 44] and non-governmental organizations (n=1) [42]. The training formats were synchronous (n=8) [28-31, 36,

39, 40, 42], asynchronous (n=5) [32, 35, 41, 44, 45] and both (synchronous and asynchronous) (n=5) [28-31, 33, 34, 37, 38, 43].

The training venue, duration, focus, and pedagogical approaches varied between studies.

Majority of the training occurred in the community (n=12) [28, 29, 31-33, 35, 36, 38, 40, 41, 44, 45] compared to a classroom (n=3) [30, 39, 42] or both (n=3) [34, 37, 43]. The trainings focused on the following disease areas: COVID-19 prevention, testing, and management (n=1) [40]; diabetes prevention (n=2) [34, 37]; general conditions care/management (n=2) [35, 39]; HIV testing services (n=2) [42, 43]; maternal and child health (n=5) [28, 29, 32, 36, 41], mental health/depression screening and counselling (n=5) [30, 31, 33, 38, 44]; and pneumonia recognition, treatment, and prevention (n=1) [45]. Most of the training was accessible online (n=9) [29-31, 33, 38-41, 43] rather than offline (n=5) [32, 35, 42, 44, 45] or both (n=4) [28, 34, 36, 37]. The duration ranged from a minimum of one day to a maximum of eight months. They lasted from one to 48 hours. The main pedagogical approaches employed were individual learning (n=5) [30, 32, 33, 41, 45] and group discussion (n=4) [28, 34, 36, 37, 44]. Other approaches included practicing scenarios, modelling, and receiving feedback to reinforce information [31, 35, 38-40, 42, 43] (Table 2). Full details of the training are summarized in Table 3

Training outcomes

Fourteen studies reported learning outcomes [28, 29, 32-38, 40, 41, 43-45]. The learning outcomes reported in the studies were knowledge, attitude and behaviors. Assessment of knowledge was made mainly through pre-training and post-training tests (n=13) [28, 29, 32-38,

40, 41, 44, 45]. All 13 studies reported improved knowledge outcomes after the training. Two studies reported improved attitude (confidence) in delivering maternal mental health services [29] and providing support to mental health patients in the community [33, 44] and one study reported improved behavior in counseling couples on all available contraceptive options and child spacing [32].

Ten studies reported implementation outcomes [28-31, 36, 41-45]. The implementation outcomes reported were acceptability, appropriateness, feasibility, and fidelity. Acceptability included perceived effectiveness, perception of remote training, usability and satisfaction (n=10) [28, 30, 31, 33, 36, 39, 42-45]. Acceptability was assessed post-training mainly through questionnaires, written qualitative feedback, or in-depth interviews. Three studies reported that participants were satisfied with the training [33, 37, 44] and the other seven reported that the training was agreeable. Two studies reported on appropriateness and found the training suitable for capacity-building for CHWs [30, 44].

About half of the studies reported on the feasibility of participating in digital training, and all found the training to be feasible [28-31, 33, 35, 36, 45]. Feasibility assessment mostly involved post-training surveys or qualitative interviews/feedback or reviewing training logs. This included responses to questions about digital device familiarity [30] to review of log-in attempts and the number of hours spent in the training system [29]. Some studies reported technical challenges that affected training feasibility. Three studies reported poor internet connectivity challenges including lag or slow internet [30, 31, 40]. Four studies reported poor cellular network

infrastructure [28, 29, 36, 43]. One mentioned other technical glitches [33] and one discussed power cuts hindering charging tablets [43].

One study reported high fidelity to the training schedule [44]. Another study found improved fidelity in providing counseling services to patients as intended based on a CHW checklist [42]. This study also reported improved effectiveness on index case testing indicators, such as sexual contacts elicited [42]. This was the only clinical outcome. Full details of the outcomes for individual studies are summarized in Table 4.

Discussion

This scoping review brings together studies and reports of the characteristics and outcomes of digital training for CHWs in LMICs. Despite a rigorous search across multiple databases and broad inclusion criteria, we identified only 18 studies, which highlights the dearth of robust evaluations of digital training in LMICs. Yet, the review indicated that despite technological and infrastructural challenges, training CHWs using digital technologies was acceptable and feasible, and led to knowledge acquisition. This body of evidence was largely descriptive, with few studies using experimental or quasi-experimental designs. Most reported only on learning outcomes with very few reporting on implementation fidelity or clinical outcomes as a result of CHW training. Additionally, the majority of studies in this review only measured Kirkpatrick Levels 1 and 2. A few measured Level 3 behaviors and only one measured Level 4 results. This highlights the need for additional research evaluating additional level 3 and 4 outcomes.

This is the first review of digital training among CHWs in LMIC. Other reviews have focused on digital training primarily for professional health workers and mostly from HICs. These reviews have similarly found relatively few studies, mostly descriptive in nature with only knowledge outcomes evaluated. A scoping review that focused on digital training for rural professional cadres [13], identified few non-experimental studies (5) and focused mainly on knowledge acquisition. Similarly, a systematic review that evaluated digital learning for medical education in LMICs [46] found two-thirds of the studies identified were from upper-middle-income countries and only four were RCTs. Additionally, a review of digital learning for professional HCWs [12] found a few studies (n=14) conducted in LMICs, only 7 were RCTs and again mainly reported knowledge outcomes.

Most of the evidence gathered in our scoping review showed that the digital or blended learning training resulted in significantly improved knowledge of CHW after the training, compared to before and is consistent with other learning modalities [47, 48]. Similarly, our results are consistent with other studies in medical education reporting on the effectiveness of digital or blended learning in enhancing knowledge acquisition among certified health professionals in both in LMICs [49, 50] and HICs [51-53]. This supports the finding that digital training accounts for the knowledge needed to perform tasks across disease entities and health cadres in both high and lower economic settings. Furthermore, a systematic review comparing the effectiveness of blended learning to traditional learning for professional/certified HCWs [14], concluded that blended learning demonstrated consistently positive effects on knowledge outcomes when

compared with traditional learning in medical education. Our work extends these findings to CHWs knowledge to perform delegated assignments.

A few studies included in this scoping review addressed acceptability and appropriateness. Feedback from CHWs suggested that they found digital or blended training acceptable for learning new information and appropriate as a mode of training. This has also been reported in other studies where digital training was acceptable among CHWs in diverse settings for data collection training [54]. Acceptability and appropriateness are important factors for training completion and skills application.

Overall, digital training was feasible, though approaches differed considerably. This is consistent with other studies with professional cadres [30, 55, 56]. For example, studies [57] in Kenya and Nigeria found digital training for HCWs was feasible at scale (56). These studies highlight the potential feasibility of implementing digital training interventions in LMICs. Digital training programs in this review included the use of various technologies including tablets, mobile phones or feature phones. Some did not require internet or physical infrastructure, which may be lacking or unreliable in low-resource settings. The use of mobile devices made it possible for synchronous or asynchronous learning models to occur. Both models appear to be of benefit. Asynchronous learning offered CHWs the opportunity to participate in the training in a flexible manner at a time and place that suited them without missing any material due to other demanding personal or work-related responsibilities. Synchronous learning offered CHWs the opportunity to participate in group discussions, ask questions in real-time and practice and receive feedback. Furthermore, synchronous sessions provided the trainees with access to technical support

periodically. With the increased use of smartphones in LMICs, digital training could successfully be implemented in LMICs [58].

This review also underlined that utilizing digital training programs in LMICs will require technological challenges to be overcome. Technical challenges, including slow or poor internet and cellular network, were frequently cited as barriers to training completion. For example, Muke et al [31] reported that due to the challenge of poor internet connectivity, some participants were unable to access all content from the training modules because videos did not play. Pre-loading training material could eliminate reliance on connectivity and may ensure availability offline [59]. In addition, using feature phones demonstrated the possibility of mitigating network challenges. The design of the digital training program is imperative. Simpler platforms may be easier to use and scale, and good accessibility, may provide efficiencies that enable greater impact of the training.

Conclusion

CHWs play an essential role in providing health care and improving health outcomes in LMICs. Currently, there are millions of CHWs in LMICs and in some countries, they may outnumber professional cadres, and training will continue to be a core component of improving CHW skills. Conducting the training well by ensuring quality and accessibility, could facilitate training at scale. Overall, this scoping review has shown that digital training is a promising strategy for CHWs' knowledge acquisition and application, but more evidence is needed on its potential to impact implementation and related clinical outcomes.

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Conflicts of interest

The authors declare that they have no competing interests.

Data availability

The data supporting the findings of this scoping review are available within the article and/or its supplementary materials.

Author's contributions

TAT, NER, and LGB conceptualized the study. TAT and FA performed the data extraction. TAT, NER and LGB analysed and interpreted results, and drafted the manuscript and all subsequent drafts. All authors critically reviewed, edited, and approved the final manuscript.

Abbreviations

ASHA	Accredited Social Health Activist
CHCW	Community Healthcare Workers

CHW	Community Health Worker
CINAHL	Cumulated Index in Nursing and Allied Health Literature
ERIC	Education Resources Information Center
FCHV	Female Community Health Volunteers
HCW	Health Care Worker
HIC	High Income Country
HIV	Human Immunodeficiency Virus
LMIC	Low- and Middle-Income Country
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews
RCTs	Randomized Controlled Trials
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SSRN	Social Science Research Network
WHO	World Health Organization

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Figure 1. PRISMA flow diagram

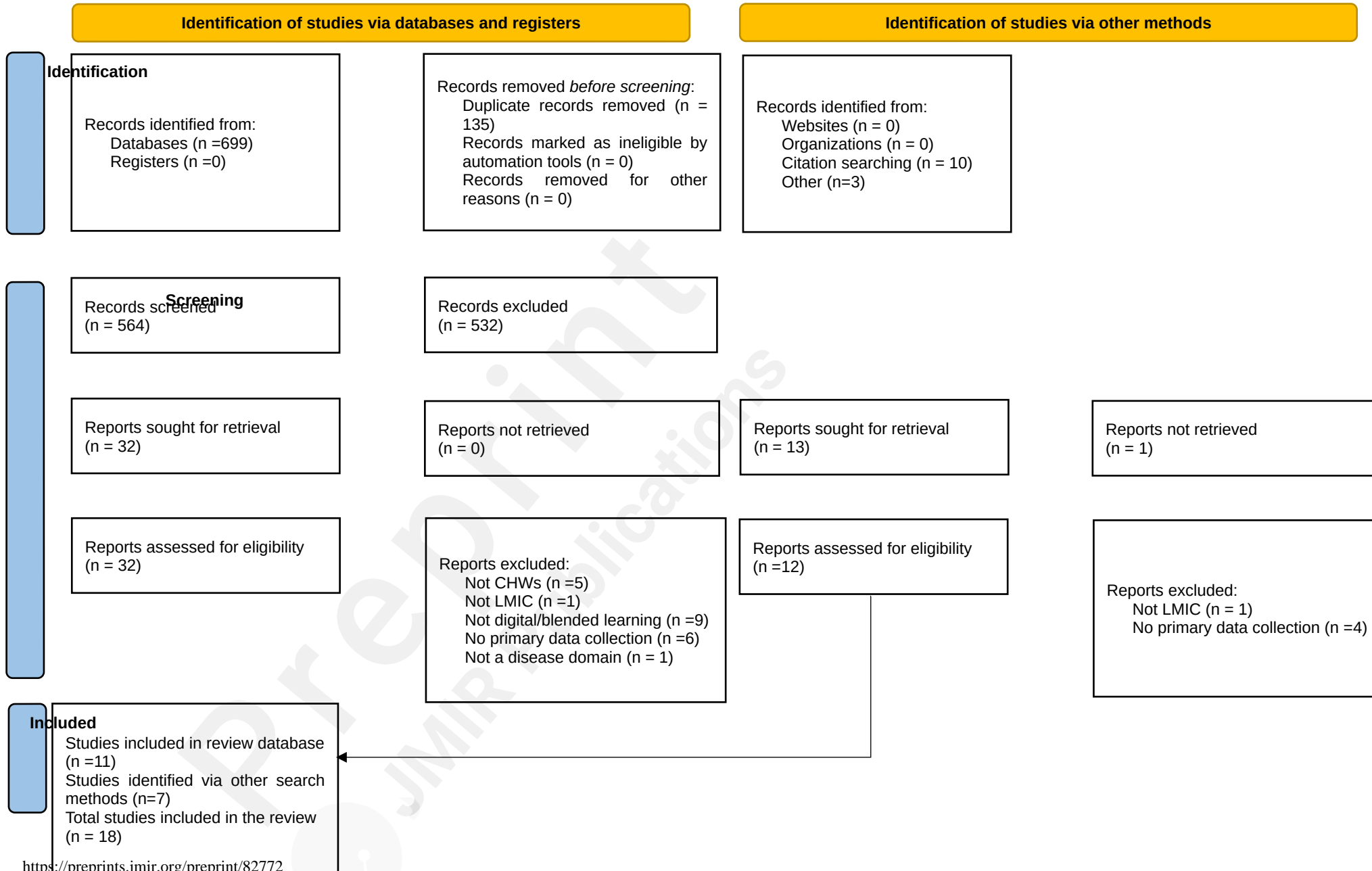


Figure 2. Map of countries where studies included in the scoping review were conducted

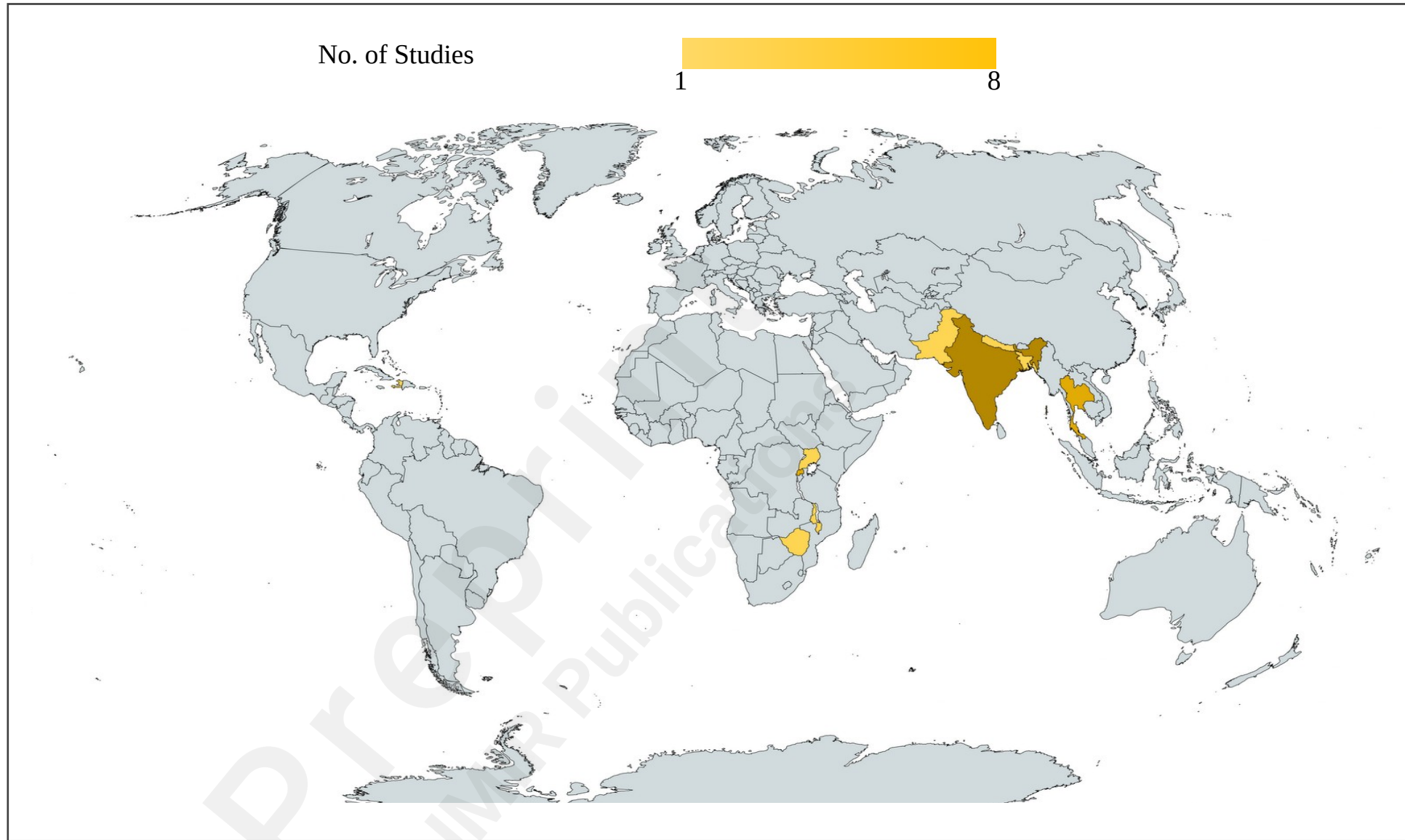


Table 1. Details of studies included

First author, year	Title	Country	Community Health Worker name	Number of Community Health Worker	Community Health Worker sex	Community Health Worker age	Community Health Worker Education	Disease domain or focus	Fulltime or part time	Community or facility based	Paid incentives or not paid	Government or non-governmental organization
Bertman et al[43] (2019)	Health worker text messaging for blended learning, peer support, and mentoring in pediatric and adolescent HIV/AIDS care: a case study in Zimbabwe	Zimbabwe	Primary Counselors (PCs)	293	Male and female	≥25 years	Secondary school education	HIV	Full-time	Facility-based	paid	Government
Khan et al[35] (2019)	An Electronic-Based Curriculum to Train Acute Care Providers in Rural Haiti and India	Haiti	Acute Care providers	6	Male and Female	Mean age 24	High school diploma	General acute conditions	Full-time	Community	Not reported	Not reported
		India	Acute Care providers	55	Female	Mean age 39	Primary education	General acute conditions	Full-time	Community	Not reported	Not reported
Kharel et al[40] (2022)	Training program for female community volunteers to combat COVID 19 in rural Nepal	Nepal	Female Community Health Volunteers (FCHV)	183	Female	Not reported	Not reported	COVID-19	Part-time	Community	Paid	Government
Lakshminarayana et al[33] (2020)	Delivery of perinatal mental health services by training lay counselors using digital platforms	India	Lay counselors	23	Female	Not reported	Not reported	Perinatal mental health	Part-time	Community	Not reported	Not reported
Limaye et al[32] (2019)	Enhancing the Knowledge and Behaviors of Fieldworkers to Promote Family Planning and	Bangladesh	Community Health workers (Field workers)	pre 306 and post 265	Female	Mean age pre 35 and mean age post 34	Not reported	Maternal, newborn, and child health and family planning	Full-time	Community	Not reported	Government

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[unpublished, non-peer-reviewed preprint]

	Maternal, Newborn, and Child Health in Bangladesh Through a Digital Health Training Package: Results From a Pilot Study											
Muke et al[30] (2019)	Acceptability and feasibility of digital technology for training community health workers to deliver brief psychological treatment for depression in rural India	India	Accredited Social Health Activist (ASHA)	32	Female	24-45years	Minimum education level of grade 8	Depression	Part-time	Community	Paid	Government
Muke et al[31] (2020)	Digital Training for Non-Specialist Health Workers to Deliver a Brief Psychological Treatment for Depression in Primary Care in India: Findings from a Randomized Pilot Study	India	Accredited Social Health Activist (ASHA)	45	Female	≥18 years	Minimum education level of 8th standard	Mental health	Part-time	Community	Paid	Government
Nedungadi et al[39] (2019)	Rural Health in Digital India: Interactive Simulations for Community Health Workers	India	Community Health Workers	23	Female	≥18 years	Minimum education level of grade 8	Communicable and non-communicable diseases and nutrition deficiency	Part-time	Community	Paid	Government
O'Donovan et al[45] (2018)	The use of low-cost Android tablets to train community health workers in Mukono, Uganda, in the recognition, treatment and prevention of pneumonia	Uganda	Community Health Workers (CHWs)	163	Male and female	Mean age 44.2	9 years of education	Pneumonia	Part-time	Community	Not paid	Government

<https://preprints.jmir.org/preprint/82772>

[unpublished, non-peer-reviewed preprint]

	children under five: a pilot randomised controlled trial											
Rahman et al[38] (2019)	Using technology to scale-up training and supervision of community health workers in the psychosocial management of perinatal depression: a non-inferiority, randomized controlled trial	Pakistan	Community Health Workers (CHWs)	80	Female	Mean age 35 years	Not reported	Perinatal depression	Full-time	Community	Paid	Government
Sangwa et al[41] (2024)	Using eLearning to improve and retain the knowledge of community health workers in maternal and neonatal health in Rwanda: A cohort study	Rwanda	Community Health Workers	36	Female	≥25 years	Completed primary education	Maternal and newborn health	Part-time	Community	Paid	Government
Sranacharoenpong et al[37] (2009)	Process and Outcome Evaluation of a Diabetes Prevention Education Program for Community Healthcare Workers in Thailand	Thailand	Community Healthcare Workers (CHCW)	69	Male and female	25-54 years	Diploma level to bachelors	Diabetes	Full-time	Facility-based	Paid	Government
Sranacharoenpong et al[34] (2012)	Diabetes Prevention Education Program for Community Health Care Workers in Thailand	Thailand	Community Healthcare Workers (CHCW)	69	Male and Female	25-54 years	Diploma level to bachelors	Diabetes	Full-time	Facility-based	Paid	Government
Tembo et al[42] (2021)	Pilot-Testing a Blended Learning	Malawi	Community Health Workers and	12	Male and Female	20-42 years	Completed secondary education	HIV	Full-time	Facility-based	Paid	Non-governmental organization

	Package for Health Care Workers to Improve Index Testing Services in Southern Malawi: An Implementation Science Study		HIV Diagnostic Assistants									
Willems et al[44] (2021)	Co-creation and Evaluation of Nationwide Remote Training Service for Mental Health Education of Community Health Workers in Rwanda	Rwanda	Community Health Workers (CHWs)	51,858	Male and Female	20-50 years	Not reported	Mental health	Part-time	Community	Paid	Government
Yadav et al[36] (2017)	Sangoshthi: Empowering Community Health Workers through Peer Learning in Rural India	India	Accredited Social Health Activist (ASHA)	40	Female	26-50 years	Minimum education level of grade 10	Maternal and child health	Part-time	Community	Paid	Government
Yadav et al[28] (2017)	Low-Cost Mobile Learning Solutions for Community Health Workers	India	Accredited Social Health Activist (ASHA)	40	Female	Not reported	Not reported	Maternal and child health	Part-time	Community	Paid	Government
Yadav et al[29] (2019)	LEAP: Scaffolding Collaborative Learning of Community Health Workers in India	India	Accredited Social Health Activist (ASHA)	120	Female	25-45 years	Minimum education level of grade 8	Maternal and child health	Part-time	Community	Paid	Government

Table 2. Digital and blended learning training characteristics

Study	Type of training	Training modality	Synchronicity (or both)	Health facility or conference or community	Device	Technology medium	Method of training (Online vs Offline)	Training accessible offline (yes/no)	Time spent in training	Training duration	Number of training sessions/modules	Pedagogical approaches
Bertman et al[43]	In-service	Blended learning	Both	Facility, classroom	Tablet, mobile phone	Videos	Online	Not reported	Not reported	7 weeks	Not reported	Learning, group discussion, feedback
Khan et al[35]	Pre-service	Digital training	asynchronous	Community	Tablet	Videos	Online, offline	Yes	Not reported	8 months Haiti	39 modules	Learning, group discussion, practice
			asynchronous	Community	Tablet	Videos	Offline	Yes	Not reported	4 months India	14 modules	Learning, group discussion, practice
Kharel et al[40]	In-service	Digital training	synchronous	Community	Not reported	Videos	Online	No	4 hours	1 day	3 modules	Learning, modelling, discussion
Lakshminarayanan et al[33]	In-service	Digital training	Both	Community	Mobile phone, tablets, basic computers	Videos	Online	no	20-25 hours	1 month	10 sessions	Learning
Limaye et al[32]	In-service	Digital training	asynchronous	Community	Computer	Videos	Offline	Yes	Not reported	4 months	8 courses	Learning
Muke et al[30]	In-service	Digital training	synchronous	Conference /classroom	Tablets, mobile phone, laptops	Videos	Online	No	2-3 hours	1 day	2 modules	Learning
Muke et al[31]	In-service	Digital training	synchronous	Community	mobile phone	Videos	Online	No	48 hours	30 days	16 modules	Learning, modelling
Nedungadi et al[39]	In-service	Digital training	synchronous	Conference	Computer	Videos	Online	No	Not reported	1 day	Not reported	Learning, practicing
O'Donovan et al[45]	In-service	Digital training	asynchronous	Community	Tablet	Videos	Offline	Yes	Not reported	5 days	4 sessions	Learning
Rahman et al[38]	In-service	Digital training	Both	Community	Tablet	Videos	Online	No	20 hours	5 days	Not reported	Learning, modelling, group discussion
Sangwa et al[41]	In-service	Digital training	asynchronous	Community	Mobile phone	Videos	Online	No	Not reported	4 weeks	4 sessions	Learning

Sranacharoenpong et al[37]	In-service	Blended learning	Both	Conference and community	Computer	Videos	Online, offline	No	20-24 hours	4 months	8 modules	Learning, discussion group
Sranacharoenpong et al[34]	In-service	Blended learning	Both	Conference and community	Computer	Videos	Online, offline	No	Not reported	4 months	8 modules	Learning, discussion group
Tembo et al[42]	In-service	Blended learning	synchronous	Conference	Computer	Videos	Offline	Yes	16 hours	2 days	Not reported	Learning, modelling, practicing, feedback
Willems et al[44]	In-service	Digital training	asynchronous	Community	Feature phone	Audios	Offline	Yes	40 minutes	4 weeks	8 modules	Learning
Yadav et al[36]	In-service	Digital training	synchronous	Community	Mobile phone, feature phone	Audios	Online, Offline	No	18 hours	22 days	12 sessions	Learning, discussion group
Yadav et al[28]	In-service	Digital training	synchronous	Community	Mobile phone, feature phone	Audios	Online, Offline	No	18 hours	22 days	12 sessions	Learning, discussion group
Yadav et al[29]	In-service	Digital training	synchronous	Community	Mobile phone, feature phone	Audios	Online	No	7.5-10 hours	6 weeks	10 sessions	Group discussion

Table 3. Panel of the training description

Bertman et al[43]	<p>WHO: 293 primary counselors from 233 health facilities in Zimbabwe were trained in the Ministry of Health HIV testing guidelines for children and adolescents.</p> <p>WHAT: The 7-week blended training included tablet-based self-study, a one-and-a-half-day classroom session at the beginning of the course, and a 4-hour classroom session at the end. The self-study component included videos, podcasts, case studies, quizzes, and self-reflection questions. These activities were complemented by the SMS component, including a whole-group discussion forum as well as two-person partner discussions. The course was facilitated by three trainers who presented content, managed logistics, and interacted with the WhatsApp groups. The training incorporated group discussions and peer support through WhatsApp, where participants could share complex cases, seek advice, and engage in problem-solving.</p> <p>OUTCOME: The SMS-based peer support and learning platform was well-received by participants, with high levels of engagement in case discussions while ensuring anonymity. Feedback indicated that the WhatsApp groups helped identify knowledge gaps and provided meaningful learning opportunities. The platform facilitated access to supervisors and experts, enriching the learning experience and fostering collaboration.</p>
Khan et al[35]	<p>WHO: 6 previously untrained lay individuals in Haiti and 55 from India were trained as Acute Care Providers (ACP) for general acute medical conditions.</p> <p>WHAT: Trainees participated in electronic, asynchronous training using videos preloaded on tablets focusing on the diagnosis, treatment, and triage of 30 acute care chief complaints specific to these communities. The training included self-study modules, weekly discussion via video conferences, and multiple assessments. In Haiti, trainees completed 39 modules over 8 months, while in India, they completed 14 modules over 4 months.</p> <p>OUTCOME: ACP demonstrated significant improvements in knowledge in diagnosing acute conditions. The training program was feasible to implement with nearly all completing the training and passing the post-test.</p>
Kharel et al[40]	<p>WHO: 183 Female Community Health Volunteers (FCHVs) in rural Nepal were trained to support the COVID-19 response.</p> <p>WHAT: The 3-module digital training program aimed to equip FCHVs with practical knowledge and skills to combat the COVID-19 pandemic. The 4-hour training included interactive didactic modules, case-based learning, discussions, and video simulations. Training materials were translated into Nepali and delivered by a lead facilitator fluent in the language.</p> <p>OUTCOME: The training led to significant improvements in knowledge among FCHVs. The program demonstrated that virtual training is feasible in low-resource settings and can effectively enhance the capacity of community health workers.</p>
Lakshminarayana et al[33]	<p>WHO: 23 Lay counselors were trained to understand, identify and respond to perinatal mental health services in India.</p> <p>WHAT: The digital training had 10 sessions delivered over a period of 1 month, each session lasted 2 to 2.5 hours. Training was delivered via videos, video conferencing and instant messaging, file transfer, screen sharing via mobile phone, tablets and basic computers.</p> <p>OUTCOME: Trained counselors were satisfied and improved knowledge to deliver mental health counseling</p>
Limaye et al[32]	<p>WHO: 306 Frontline Workers (FWs) in rural Bangladesh were trained to promote family planning and maternal, newborn, and child health.</p> <p>WHAT: A digital training package was implemented for a 4-month duration using 8 courses accessible offline via netbooks (basic computer). Training incorporated multimedia elements, interactive learning, videos, and text messages to reinforce key concepts.</p> <p>OUTCOME: Significant improvements in mean knowledge scores across family planning and maternal, newborn, and child health topics were observed. Measurable changes in counseling behaviors were reported.</p>
Muke et al[30]	<p>WHO: 32 Accredited Social Health Activists (ASHAs) in rural India were trained to treat depression by delivering Healthy Activity Program (HAP).</p> <p>WHAT: Training was conducted using videos, PowerPoints with voice-over narration utilizing tablets, mobile phones, and laptops. Training was for 2-3 hours.</p> <p>OUTCOME: ASHAs found the training acceptable for learning new content and feasible to use.</p>
Muke et al[31]	<p>WHO: 45 Accredited Social Health Activists participated in the study in Madhya Pradesh, India were trained to treat depression by delivering Healthy Activity Program (HAP).</p> <p>WHAT: ASHAs randomized to the digital training received 48 hours of training over 30 days using a mobile phone through Moodle Learning Management system. The training sessions consisted of videos, role-play videos and PowerPoint presentation, reading materials.</p> <p>OUTCOME: The training improved knowledge and skills in delivering the HAP for depression.</p>

Nedungadi et al[39]	<p>WHO: 23 Community health workers (CHWs) trained in management of communicable and non-communicable diseases and nutritional deficiency in rural India.</p> <p>WHAT: The SwastyaSIM is a digital training accessible online via a smartphone or computer designed to improve health literacy among CHWs by offering interactive simulations for medical training, including diagnostic tests.</p> <p>OUTCOME: SwastyaSIM significantly improved the knowledge of CHWs, particularly in infection control practices.</p>
O'Donovan et al[45]	<p>WHO: 163 Community health workers in Mukono, Uganda, participating in a pilot randomized controlled trial.</p> <p>WHAT: CHWs participated in a digital training to recognize, treat and prevent pneumonia in accordance with integrated Community Case Management (iCCM) utilizing tablets preloaded with videos in the local dialect (Luganda) with English subtitles for 5 days.</p> <p>OUTCOME: Training showed improvements in test scores, in terms of knowledge acquisition post training.</p>
Rahman et al[38]	<p>WHO: 80 Lady Health Workers (LHWs) in Pakistan were trained in the psychosocial management of perinatal depression.</p> <p>WHAT: LHWs participated in the 20-hour digital training consisting of videos, role-play videos, sharing experiences and problem-solving strategies over 5 days.</p> <p>OUTCOME: LHW competency improved after the training.</p>
Sangwa et al[41]	<p>WHO: 36 Community Health Workers (CHWs) in Rutsiro (rural) and Ngoma (peri-urban) districts of Rwanda were trained in maternal and neonatal health.</p> <p>WHAT: The training was delivered via the Ministry of Health's (MOH) eLearning platform, based on Moodle through a smartphone over 4 weeks.</p> <p>OUTCOME: Post-intervention and 6-month follow-up tests showed a significant increase in knowledge. Older CHWs performed better in follow-up tests, while all experience levels demonstrated consistent improvement, highlighting the effectiveness of eLearning across diverse learner groups.</p>
Sranachoenpong et al[37]	<p>WHO: 69 Community Health Care Workers (CHCWs) in Thailand were trained in diabetes prevention education training.</p> <p>WHAT: The training integrated traditional and E-learning approaches, using 8 in-classroom sessions and 8 online learning sessions for 4-month duration. Each session was for 2.5-3 hours. Learning materials included videos, lecture notes, PowerPoint presentations, and monthly newsletters. A facilitator coordinated discussions and provided virtual support during the training period.</p> <p>OUTCOME: Post-intervention knowledge scores significantly improved. Participants demonstrated enhanced skills in measuring health metrics and understanding dietary recommendations.</p>
Sranachoenpong et al[34]	<p>WHO: 69 Community Health Care Workers (CHCWs) were trained in a tailored diabetes prevention education program in Chiang Mai, Thailand.</p> <p>WHAT: The intervention involved eight group classes and eight self-directed E-learning sessions using videos via a computer over four months. Each session was for 2.5 to 3 hours.</p> <p>OUTCOME: Knowledge improvement was significant, and CHCWs felt confident in applying the knowledge and believed they could teach at-risk populations about diabetes prevention.</p>
Tembo et al[42]	<p>WHO: 12 healthcare workers (HCWs) from six facilities in Southern Malawi were trained to deliver the Malawi's index case testing services.</p> <p>WHAT: The HCW were trained using a blended learning package (combining digital and face-to-face approach) for 16 hours in 2 days to improve Malawi's HIV index case testing services.</p> <p>OUTCOME: The blended learning package resulted in significant improvements in HCWs' fidelity to the index testing protocol. The package was perceived to be acceptable by HCWs, and improved a number of meaningful clinical indicators, including index clients counseled, contacts elicited, and contacts who reported for HIV testing.</p>
Willems et al[44]	<p>WHO: Over 51,000 Community Health Workers (CHWs) across Rwanda participated in a nationwide remote training service (RTS) focused on mental health education.</p> <p>WHAT: The RTS used Interactive Voice Response (IVR) technology to deliver audio-based training modules to CHWs via simple feature phones. Over four weeks, two modules lasting 5 minutes each were released weekly, totaling eight modules covering topics such as common mental disorders, PTSD, depression, drug abuse, and epilepsy.</p> <p>OUTCOME: Knowledge of mental health topics significantly improved after the training. CHWs' awareness and self-confidence in identifying and referring patients with mental health conditions were enhanced.</p>

Yadav et al[36]	<p>WHO: 40 Accredited Social Health Activists (ASHAs) in India participated in a maternal and child health care training.</p> <p>WHAT: The digital training included 12 sessions covering 10 topics over a period of 22 days. The content was adapted to local contexts and recorded in an audio dialogue format. ASHAs accessed training via feature phones, while trainers used smartphones with internet connectivity to conduct the training.</p> <p>OUTCOME: The ASHAs showed a significant improvement in knowledge post-intervention compared to the control group.</p>
Yadav et al[28]	<p>WHO: 40 community health workers in India participated in the training program.</p> <p>WHAT: The digital training consists of facilitators using a smartphone scheduling to call participants through their feature phones. The facilitator delivered the training using audios and needed an internet connection to conduct the training while the participant needs to be where there is telecommunication network to participate in the training.</p> <p>OUTCOME: The training program significantly improved ASHAs' knowledge on maternal and child health. The training allowed for interaction and discussion with experts and peer learning, fostering active engagement.</p>
Yadav et al[29]	<p>WHO: 120 Accredited Social Health Activists (ASHAs) in India were trained in maternal and child health are through a peer-led educational intervention.</p> <p>WHAT: ASHAs were provided with pre-recorded audio learning materials in the native language (Hindi) and were expected to listen to three sessions via feature phones and discuss as a small group discussion. The duration of a single session was 15 minutes. Sessions were scheduled in the afternoons with flexibility to reschedule. Group facilitators (ASHA with a smartphone) played a key role in leading discussions and promoting engagement.</p> <p>OUTCOME: The intervention resulted in significant knowledge gains and ASHAs reported feeling empowered through peer discussions and knowledge-sharing.</p>

Table 4. Digital and blended learning training outcomes

Study	Analytic approach	Knowledge	Attitude	Behaviors	Acceptability	Appropriateness	Feasibility	Fidelity	Effectiveness
Bertman et al[43]	Qualitative	No	No	No	Yes	No	No	No	No
Khan et al[35]	Quantitative	Yes	No	No	No	No	Yes	No	No
Kharel et al[40]	Quantitative	Yes	No	No	No	No	No	No	No
Lakshminarayanan et al[33]	Quantitative	Yes	Somewhat	No	Somewhat	No	Somewhat	No	No
Limaye et al[32]	Quantitative	Yes	No	Yes	No	No	No	No	No
Muke et al[30]	Qualitative	No	No	No	Yes	Yes	Yes	No	No
Muke et al[31]	Mixed	Yes	No	No	Yes	No	Yes	No	No
Nedungadi et al[39]	Mixed	No	No	No	Yes	No	No	No	No
O'Donovan et al[45]	Quantitative	Yes	No	No	Yes	No	Yes	No	No
Rahman et al[38]	Quantitative	Yes	No	No	No	No	No	No	No
Sangwa et al[41]	Quantitative	Yes	No	No	No	No	No	No	No
Sranacharoenpong et al[37]	Quantitative	Yes	No	No	No	No	No	No	No
Sranacharoenpong et al[34]	Quantitative	Yes	No	No	No	No	No	No	No
Tembo et al[42]	Quantitative	No	No	No	Yes	No	No	Yes	Yes
Willems et al[44]	Mixed	Yes	Yes	No	Yes	Yes	No	Yes	No
Yadav et al[36]	Mixed	Yes	No	No	Yes	No	Yes	No	No
Yadav et al[28]	Mixed	Yes	No	No	Yes	No	Yes	No	No
Yadav et al[29]	Mixed	Yes	No	No	No	No	Yes	No	No

Supplementary Table 1: Database search strategies, including search terms

Database(s)	Search strategy
PubMed	<p>#4 - #1 AND #2 AND #3</p> <p>#3 - Search:</p> <p>(((developing countr*[Title/Abstract]) OR (developing countries[Title/Abstract])) OR (developing nation*[Title/Abstract])) OR (developing world[Title/Abstract])) OR (less-developed countr*[Title/Abstract])) OR (less developed countr*[Title/Abstract])) OR (less-developed world[Title/Abstract])) OR (lesser developed world[Title/Abstract])) OR (lesser-developed countr*[Title/Abstract])) OR (lesser developed countr*[Title/Abstract])) OR (lesser-developed nation*[Title/Abstract])) OR (lesser developed nation*[Title/Abstract])) OR (lesser-developed world[Title/Abstract])) OR (under-developed countr*[Title/Abstract])) OR (under developed countr*[Title/Abstract])) OR (under-developed nation*[Title/Abstract])) OR (under developed nation*[Title/Abstract])) OR (under-developed world[Title/Abstract])) OR (under developed world[Title/Abstract])) OR (underdeveloped countr*[Title/Abstract])) OR (under-developed countr*[Title/Abstract])) OR (Under developed countr*[Title/Abstract])) OR (under developed nation*[Title/Abstract])) OR (underdeveloped nation*[Title/Abstract])) OR (lower middle income country[Title/Abstract])) OR (lower middle-income country[Title/Abstract])) OR (lower middle income nation[Title/Abstract])) OR (lower middle income nation[Title/Abstract])) OR (upper middle-income country[Title/Abstract])) OR (upper middle income country[Title/Abstract])) OR (upper middle-income nation[Title/Abstract])) OR (upper middle income nation[Title/Abstract])) OR (low-income country[Title/Abstract])) OR (low income country[Title/Abstract])) OR (low-income nation[Title/Abstract])) OR (low income nation[Title/Abstract])) OR (lower income country[Title/Abstract])) OR (lower-income country[Title/Abstract])) OR (lower income nation[Title/Abstract])) OR (lower-income nation[Title/Abstract])) OR (lower middle income countries[Title/Abstract])) OR (lower middle-income countries[Title/Abstract])) OR (lower middle income nation[Title/</p>

Abstract])) OR (lower middle-income nation[Title/Abstract])) OR (upper middle-income countries[Title/Abstract])) OR (upper middle income countries[Title/Abstract])) OR (upper middle-income nation[Title/Abstract])) OR (upper middle income nation[Title/Abstract])) OR (low income countries[Title/Abstract])) OR (low income countries[Title/Abstract])) OR (low-income nation[Title/Abstract])) OR (low income nation[Title/Abstract])) OR (lower income countries[Title/Abstract])) OR (lower-income countries[Title/Abstract])) OR (lower income nation[Title/Abstract])) OR (lower-income nation[Title/Abstract])) OR (lmic[Title/Abstract])) OR (lmics[Title/Abstract])) OR (third world[Title/Abstract])) OR (lami countr*[Title/Abstract])) OR (transitional countr*[Title/Abstract])) OR (majority world[Title/Abstract])) OR (Global South[Title/Abstract])) OR (LMIC[Title/Abstract])) OR (LMICs[Title/Abstract])) OR (LIC[Title/Abstract])) OR (LICs[Title/Abstract])) OR (LMICs[Title/Abstract])) OR (LMIC[Title/Abstract])) OR (UMICs[Title/Abstract])) OR (UMIC[Title/Abstract])) OR (Afghanistan[Title/Abstract])) OR (Burkina Faso[Title/Abstract])) OR (Burundi[Title/Abstract])) OR (Central African Republic[Title/Abstract])) OR (Chad[Title/Abstract])) OR (Congo, Dem. [Title/Abstract])) OR (Eritrea[Title/Abstract])) OR (Ethiopia[Title/Abstract])) OR (Gambia[Title/Abstract])) OR (Guinea-Bissau[Title/Abstract])) OR (Korea, Dem. People's Rep[Title/Abstract])) OR (Liberia[Title/Abstract])) OR (Madagascar[Title/Abstract])) OR (Malawi[Title/Abstract])) OR (Mali[Title/Abstract])) OR (Mozambique[Title/Abstract])) OR (Niger[Title/Abstract])) OR (Rwanda[Title/Abstract])) OR (Sierra Leone[Title/Abstract])) OR (Somalia[Title/Abstract])) OR (South Sudan[Title/Abstract])) OR (Sudan[Title/Abstract])) OR (Syrian Arab Republic[Title/Abstract])) OR (Togo[Title/Abstract])) OR (Uganda[Title/Abstract])) OR (Yemen, Rep. [Title/Abstract])) OR (Angola[Title/Abstract])) OR (Algeria[Title/Abstract])) OR (Bangladesh[Title/Abstract])) OR (Benin[Title/Abstract])) OR (Bhutan[Title/Abstract])) OR (Bolivia[Title/Abstract])) OR (Cabo Verde[Title/Abstract])) OR (Cambodia[Title/Abstract])) OR (Cameroon[Title/Abstract])) OR (Comoros[Title/Abstract])) OR (Congo, Rep.[Title/Abstract])) OR (Côte d'Ivoire[Title/Abstract])) OR (Djibouti[Title/Abstract])) OR (Egypt, Arab Rep.[Title/Abstract])) OR (Eswatini[Title/Abstract])) OR

(Ghana[Title/Abstract])) OR (Guinea[Title/Abstract])) OR
(Haiti[Title/Abstract])) OR (Honduras[Title/Abstract])) OR
(Jordan[Title/Abstract])) OR (India[Title/Abstract])) OR (Iran, Islamic
Rep[Title/Abstract])) OR (Kenya[Title/Abstract])) OR
(Kiribati[Title/Abstract])) OR (Kyrgyz Republic[Title/Abstract])) OR (Lao
PDR[Title/Abstract])) OR (Lebanon[Title/Abstract])) OR
(Lesotho[Title/Abstract])) OR (Mauritania[Title/Abstract])) OR
(Micronesia, Fed. Sts.[Title/Abstract])) OR (Mongolia[Title/Abstract])) OR
(Morocco[Title/Abstract])) OR (Myanmar[Title/Abstract])) OR
(Nepal[Title/Abstract])) OR (Nicaragua[Title/Abstract])) OR
(Nigeria[Title/Abstract])) OR (Pakistan[Title/Abstract])) OR (Papua New
Guinea[Title/Abstract])) OR (Philippines[Title/Abstract])) OR
(Samoa[Title/Abstract])) OR (São Tomé[Title/Abstract])) OR
(Principe[Title/Abstract])) OR (Senegal[Title/Abstract])) OR (Solomon
Islands[Title/Abstract])) OR (Sri Lanka[Title/Abstract])) OR
(Tanzania[Title/Abstract])) OR (Tajikistan[Title/Abstract])) OR (Timor-
Leste[Title/Abstract])) OR (Tunisia[Title/Abstract])) OR
(Ukraine[Title/Abstract])) OR (Uzbekistan[Title/Abstract])) OR
(Vanuatu[Title/Abstract])) OR (Vietnam[Title/Abstract])) OR
(Zambia[Title/Abstract])) OR (Zimbabwe[Title/Abstract])) OR
(Albania[Title/Abstract])) OR (Argentina[Title/Abstract])) OR
(Armenia[Title/Abstract])) OR (Azerbaijan[Title/Abstract])) OR
(Belarus[Title/Abstract])) OR (Belize[Title/Abstract])) OR
(Bosnia[Title/Abstract])) OR (Herzegovina[Title/Abstract])) OR
(Botswana[Title/Abstract])) OR (Brazil[Title/Abstract])) OR
(Bulgaria[Title/Abstract])) OR (China[Title/Abstract])) OR
(Colombia[Title/Abstract])) OR (Costa Rica[Title/Abstract])) OR
(Cuba[Title/Abstract])) OR (Dominica[Title/Abstract])) OR (Dominican
Republic[Title/Abstract])) OR (El Salvador[Title/Abstract])) OR
(Equatorial Guinea[Title/Abstract])) OR (Ecuador[Title/Abstract])) OR
(Fiji[Title/Abstract])) OR (Gabon[Title/Abstract])) OR
(Georgia[Title/Abstract])) OR (Grenada[Title/Abstract])) OR
(Guatemala[Title/Abstract])) OR (Indonesia[Title/Abstract])) OR
(Iraq[Title/Abstract])) OR (Jamaica[Title/Abstract])) OR
(Kazakhstan[Title/Abstract])) OR (Kosovo[Title/Abstract])) OR
(Libya[Title/Abstract])) OR (Malaysia[Title/Abstract])) OR
(Maldives[Title/Abstract])) OR (Marshall Islands[Title/Abstract])) OR

(Mauritius[Title/Abstract])) OR (Mexico[Title/Abstract])) OR (Moldova[Title/Abstract])) OR (Montenegro[Title/Abstract])) OR (Namibia[Title/Abstract])) OR (North Macedonia[Title/Abstract])) OR (Palau[Title/Abstract])) OR (Paraguay[Title/Abstract])) OR (Peru[Title/Abstract])) OR (Russian Federation[Title/Abstract])) OR (Serbia[Title/Abstract])) OR (South Africa[Title/Abstract])) OR (St. Lucia[Title/Abstract])) OR (St. Vincent[Title/Abstract])) OR (Suriname[Title/Abstract])) OR (Thailand[Title/Abstract])) OR (Tonga[Title/Abstract])) OR (Türkiye[Title/Abstract])) OR (Turkmenistan[Title/Abstract])) OR (Tuvalu[Title/Abstract])) OR (West Bank[Title/Abstract])) OR (Gaza[Title/Abstract])

#2 - Search: (((((((((((((((((((Community health care worker*[Title/Abstract]) OR (CHW*[Title/Abstract])) OR (Community health worker*[Title/Abstract])) OR (Front line health worker*[Title/Abstract])) OR (Outreach worker*[Title/Abstract])) OR (Lay health worker*[Title/Abstract])) OR (Lay counsellor*[Title/Abstract])) OR (Health promoter*[Title/Abstract])) OR (Village health worker*[Title/Abstract])) OR (Volunteer health worker*[Title/Abstract])) OR (Community volunteer*[Title/Abstract])) OR (Village health volunteer*[Title/Abstract])) OR (Lady health worker*[Title/Abstract])) OR (Barangay health worker*[Title/Abstract])) OR (Outreach educator*[Title/Abstract])) OR (Shas*[Title/Abstract])) OR (Shebika[Title/Abstract])) OR (Shastho karmis[Title/Abstract])) OR (Village health helper*[Title/Abstract])) OR (Accredited Social Health Activist, ASHA[Title/Abstract])) OR (Family Health Worker*[Title/Abstract])) OR (Peer Educator*[Title/Abstract])

#1- Search: (((((((((((((((((((Virtual learning[Title/Abstract]) OR (e-learning[Title/Abstract])) OR (elearning[Title/Abstract])) OR (Electronic learning[Title/Abstract])) OR (Online learning[Title/Abstract])) OR (Distance learning[Title/Abstract])) OR (Massive Open Online Course[Title/Abstract])) OR (MOOC[Title/Abstract])) OR (Mobile learning[Title/Abstract])) OR (m-learning[Title/Abstract])) OR (mlearning[Title/Abstract])) OR (Webbased[Title/Abstract])) OR (Web-based[Title/Abstract])) OR (Offline learning[Title/Abstract])) OR (Offline distance learning[Title/Abstract])) OR (Technology enhanced learning[Title/Abstract])) OR (Digital innovations[Title/Abstract])) OR (Hybrid learning[Title/Abstract])) OR (Flipped learning[Title/Abstract]))

	OR (Blended education[Title/Abstract])) OR (Multi-model learning[Title/Abstract])) OR (Hyflex learning[Title/Abstract])) OR (Asynchronous learning[Title/Abstract])
CINHAL	<p>S4 – S1 AND S2 AND S3</p> <p>S3 - (TI "developing countr*" OR AB "developing countr*" OR TI "developing countries" OR AB "developing countries" OR TI "developing nation*" OR AB "developing nation*" OR TI "developing world" OR AB "developing world" OR TI "less-developed countr*" OR AB "less-developed countr*" OR TI "less developed countr*" OR AB "less developed countr*" OR TI "less-developed world" OR AB "less-developed world" OR TI "lesser developed world" OR AB "lesser developed world" OR TI "lesser-developed countr*" OR AB "lesser-developed countr*" OR TI "lesser developed countr*" OR AB "lesser developed countr*" OR TI "lesser-developed nation*" OR AB "lesser-developed nation*" OR TI "lesser developed nation*" OR AB "lesser developed nation*" OR TI "lesser-developed world" OR AB "lesser-developed world" OR TI "under-developed countr*" OR AB "under-developed countr*" OR TI "under developed countr*" OR AB "under developed countr*" OR TI "under-developed nation*" OR AB "under-developed nation*" OR TI "under developed nation*" OR AB "under developed nation*" OR TI "under-developed world" OR AB "under-developed world" OR TI "underdeveloped world" OR AB "underdeveloped world" OR TI "under developed world" OR AB "under developed world" OR TI "underdeveloped countr*" OR AB "underdeveloped countr*" OR TI "under-developed countr*" OR AB "under-developed countr*" OR TI "under developed nation*" OR AB "under developed nation*" OR TI "underdeveloped nation*" OR AB "underdeveloped nation*" OR TI "lower middle income country" OR AB "lower middle income country" OR TI "lower middle-income country" OR AB "lower middle-income country" OR TI "lower middle income nation*" OR AB "lower middle income nation*" OR TI "lower middle-income nation*" OR AB "lower middle-income nation*" OR TI "upper middle-income country" OR AB "upper middle-income country" OR TI "upper middle income country" OR AB "upper middle income country" OR TI "upper middle-income nation*" OR AB "upper middle-income nation*" OR TI "upper middle income nation*" OR AB "upper middle income nation*" OR TI "low-income country" OR AB "low-income country" OR TI "low income country" OR AB "low</p>

income country" OR TI "low-income nation*" OR AB "low-income nation*" OR TI "low income nation*" OR AB "low income nation*" OR TI "lower income country" OR AB "lower income country" OR TI "lower-income country" OR AB "lower-income country" OR TI "lower income nation*" OR AB "lower income nation*" OR TI "lower-income nation*" OR AB "lower-income nation*" OR TI "lmic" OR AB "lmic" OR TI "lmics" OR AB "lmics" OR TI "third world" OR AB "third world" OR TI "lami countr*" OR AB "lami countr*" OR TI "transitional countr*" OR AB "transitional countr*" OR TI "majority world" OR AB "majority world" OR TI "global south" OR AB "global south" OR TI LMIC OR AB LMIC OR TI LMICs OR AB LMICs OR TI LIC OR AB LIC OR TI LICs OR AB LICs OR TI LMICs OR AB LMICs OR TI LMIC OR AB LMIC OR TI UMICs OR AB UMICs OR TI UMIC OR AB UMIC OR TI Afghanistan OR AB Afghanistan OR TI Burkina Faso OR AB Burkina Faso OR TI Burundi OR AB Burundi OR TI "Central African Republic" OR AB "Central African Republic" OR TI Chad OR AB Chad OR TI "Congo, Dem." OR AB "Congo, Dem." OR TI Eritrea OR AB Eritrea OR TI Ethiopia OR AB Ethiopia OR TI Gambia OR AB Gambia OR TI "Guinea-Bissau" OR AB "Guinea-Bissau" OR TI "Korea, Dem. People's Rep" OR AB "Korea, Dem. People's Rep" OR TI Liberia OR AB Liberia OR TI Madagascar OR AB Madagascar OR TI Malawi OR AB Malawi OR TI Mali OR AB Mali OR TI Mozambique OR AB Mozambique OR TI Niger OR AB Niger OR TI Rwanda OR AB Rwanda OR TI "Sierra Leone" OR AB "Sierra Leone" OR TI Somalia OR AB Somalia OR TI "South Sudan" OR AB "South Sudan" OR TI Sudan OR AB Sudan OR TI "Syrian Arab Republic" OR AB "Syrian Arab Republic" OR TI Togo OR AB Togo OR TI Uganda OR AB Uganda OR TI Yemen, Rep. OR AB "Yemen, Rep." OR TI Angola OR AB Angola OR TI Algeria OR AB Algeria OR TI Bangladesh OR AB Bangladesh OR TI Benin OR AB Benin OR TI Bhutan OR AB Bhutan OR TI Bolivia OR AB Bolivia OR TI "Cabo Verde" OR AB "Cabo Verde" OR TI Cambodia OR AB Cambodia OR TI Cameroon OR AB Cameroon OR TI Comoros OR AB Comoros OR TI "Congo, Rep." OR AB "Congo, Rep." OR TI "Côte d'Ivoire" OR AB "Côte d'Ivoire" OR TI Djibouti OR AB Djibouti OR TI "Egypt, Arab Rep." OR AB "Egypt, Arab Rep." OR TI Eswatini OR AB Eswatini OR TI Ghana OR AB Ghana OR TI Guinea OR AB Guinea OR TI Haiti OR AB Haiti OR TI Honduras OR AB Honduras OR TI Jordan OR AB Jordan OR TI India OR AB India

OR TI "Iran, Islamic Rep" OR AB "Iran, Islamic Rep" OR TI Kenya OR AB Kenya OR TI Kiribati OR AB Kiribati OR TI "Kyrgyz Republic" OR AB "Kyrgyz Republic" OR TI "Lao PDR" OR AB "Lao PDR" OR TI Lebanon OR AB Lebanon OR TI Lesotho OR AB Lesotho OR TI Mauritania OR AB Mauritania OR TI "Micronesia, Fed. Sts." OR AB "Micronesia, Fed. Sts." OR TI Mongolia OR AB Mongolia OR TI Morocco OR AB Morocco OR TI Myanmar OR AB Myanmar OR TI Nepal OR AB Nepal OR TI Nicaragua OR AB Nicaragua OR TI Nigeria OR AB Nigeria OR TI Pakistan OR AB Pakistan OR TI "Papua New Guinea" OR AB "Papua New Guinea" OR TI Philippines OR AB Philippines OR TI Samoa OR AB Samoa OR TI "São Tomé" OR AB "São Tomé" OR TI "Príncipe" OR AB "Príncipe" OR TI Senegal OR AB Senegal OR TI "Solomon Islands" OR AB "Solomon Islands" OR TI "Sri Lanka" OR AB "Sri Lanka" OR TI Tanzania OR AB Tanzania OR TI Tajikistan OR AB Tajikistan OR TI "Timor-Leste" OR AB "Timor-Leste" OR TI Tunisia OR AB Tunisia OR TI Ukraine OR AB Ukraine OR TI Uzbekistan OR AB Uzbekistan OR TI Vanuatu OR AB Vanuatu OR TI Vietnam OR AB Vietnam OR TI Zambia OR AB Zambia OR TI Zimbabwe OR AB Zimbabwe OR TI Albania OR AB Albania OR TI Argentina OR AB Argentina OR TI Armenia OR AB Armenia OR TI Azerbaijan OR AB Azerbaijan OR TI Belarus OR AB Belarus OR TI Belize OR AB Belize OR TI Bosnia OR AB Bosnia OR TI Herzegovina OR AB Herzegovina OR TI Botswana OR AB Botswana OR TI Brazil OR AB Brazil OR TI Bulgaria OR AB Bulgaria OR TI China OR AB China OR TI Colombia OR AB Colombia OR TI "Costa Rica" OR AB "Costa Rica" OR TI Cuba OR AB Cuba OR TI Dominica OR AB Dominica OR TI "Dominican Republic" OR AB "Dominican Republic" OR TI "El Salvador" OR AB "El Salvador" OR TI "Equatorial Guinea" OR AB "Equatorial Guinea" OR TI Ecuador OR AB Ecuador OR TI Fiji OR AB Fiji OR TI Gabon OR AB Gabon OR TI Georgia OR AB Georgia OR TI Grenada OR AB Grenada OR TI Guatemala OR AB Guatemala OR TI Indonesia OR AB Indonesia OR TI Iraq OR AB Iraq OR TI Jamaica OR AB Jamaica OR TI Kazakhstan OR AB Kazakhstan OR TI Kosovo OR AB Kosovo OR TI Libya OR AB Libya OR TI Malaysia OR AB Malaysia OR TI Maldives OR AB Maldives OR TI "Marshall Islands" OR AB "Marshall Islands" OR TI Mauritius OR AB Mauritius OR TI Mexico OR AB Mexico OR TI Moldova OR AB Moldova OR TI Montenegro OR AB Montenegro OR TI Namibia OR AB

Namibia OR TI "North Macedonia" OR AB "North Macedonia" OR TI Palau OR AB Palau OR TI Paraguay OR AB Paraguay OR TI Peru OR AB Peru OR TI "Russian Federation" OR AB "Russian Federation" OR TI Serbia OR AB Serbia OR TI "South Africa" OR AB "South Africa" OR TI "St. Lucia" OR AB "St. Lucia" OR TI "St. Vincent" OR AB "St. Vincent" OR TI Suriname OR AB Suriname OR TI Thailand OR AB Thailand OR TI Tonga OR AB Tonga OR TI Türkiye OR AB Türkiye OR TI "Turkmenistan" OR AB "Turkmenistan" OR TI Tuvalu OR AB Tuvalu OR TI "West Bank" OR AB "West Bank" OR TI Gaza OR AB Gaza)

S2 - (TI "community health care worker*" OR AB "community health care worker*" OR TI CHW OR AB CHW OR TI CHWs OR AB CHWs OR TI "community health worker*" OR AB "community health worker*" OR TI "front line health worker*" OR AB "front line health worker*" OR TI "outreach worker*" OR AB "outreach worker*" OR TI "lay health worker*" OR AB "lay health worker*" OR TI "lay counsellor*" OR AB "lay counsellor*" OR TI "health promoter*" OR AB "health promoter*" OR TI "village health worker*" OR AB "village health worker*" OR TI "volunteer health worker*" OR AB "volunteer health worker*" OR TI "community volunteer*" OR AB "community volunteer*" OR TI "village health volunteer*" OR AB "village health volunteer*" OR TI "lady health worker*" OR AB "lady health worker*" OR TI "barangay health worker*" OR AB "barangay health worker*" OR TI "outreach educator*" OR AB "outreach educator*" OR TI Shas* OR AB Shas* OR TI Shebika OR AB Shebika OR TI "shastho karmis" OR AB "shastho karmis" OR TI "village health helper*" OR AB "village health helper*" OR TI "accredited social health activist" OR AB "accredited social health activist" OR TI ASHA OR AB ASHA OR TI "family health worker*" OR AB "family health worker*" OR TI "peer educator*" OR AB "peer educator*")

S1 - (TI "virtual learning" OR AB "virtual learning" OR TI e-learning OR AB e-learning OR TI elearning OR AB elearning OR TI "electronic learning" OR AB "electronic learning" OR TI "online learning" OR AB "online learning" OR TI "distance learning" OR AB "distance learning" OR TI "massive open online course" OR AB "massive open online course" OR TI MOOC OR AB MOOC OR TI "mobile learning" OR AB "mobile learning" OR TI m-learning OR AB m-learning OR TI mlearning OR AB mlearning OR TI "webbased" OR AB "webbased" OR TI "web-based" OR AB "web-based" OR TI "offline learning" OR AB "offline learning" OR TI

	<p>"offline distance learning" OR AB "offline distance learning" OR TI "technology enhanced learning" OR AB "technology enhanced learning" OR TI "digital innovations" OR AB "digital innovations" OR TI "hybrid learning" OR AB "hybrid learning" OR TI "flipped learning" OR AB "flipped learning" OR TI "blended education" OR AB "blended education" OR TI "multi-model learning" OR AB "multi-model learning" OR TI "hyflex learning" OR AB "hyflex learning" OR TI "asynchronous learning" OR AB "asynchronous learning")</p>
SCOPUS	<p>(TITLE-ABS-KEY ("virtual learning" OR "e-learning" OR "elearning" OR "electronic learning" OR "online learning" OR "distance learning" OR "massive open online course" OR "mooc" OR "mobile learning" OR "m-learning" OR "mlearning" OR "webbased" OR "web-based" OR "offline learning" OR "offline distance learning" OR "technology enhanced learning" OR "digital innovations" OR "hybrid learning" OR "flipped learning" OR "blended education" OR "multi-model learning" OR "hyflex learning" OR "asynchronous learning")) AND (TITLE-ABS-KEY ("community health care worker*" OR "chw*" OR "community health worker*" OR "front line health worker*" OR "outreach worker*" OR "lay health worker*" OR "lay counsellor*" OR "health promoter*" OR "village health worker*" OR "volunteer health worker*" OR "community volunteer*" OR "village health volunteer*" OR "lady health worker*" OR "barangay health worker*" OR "outreach educator*" OR "shas*" OR "shebika" OR "shastho karmis" OR "village health helper*" OR "accredited social health activist, asha" OR "family health worker*" OR "peer educator*")) AND (TITLE-ABS-KEY ("developing countr*" OR "developing countries" OR "developing nation*" OR "developing world" OR "less-developed countr*" OR "less developed countr*" OR "less-developed world" OR "lesser developed world" OR "lesser-developed countr*" OR "lesser developed countr*" OR "lesser-developed nation*" OR "lesser developed nation*" OR "lesser-developed world" OR "under-developed countr*" OR "under developed countr*" OR "under-developed nation*" OR "under developed nation*" OR "under-developed world" OR "underdeveloped world" OR "under developed world" OR "underdeveloped countr*" OR "under-developed countr*" OR "under developed countr*" OR "under developed nation*" OR "underdeveloped nation*" OR "lower middle income country" OR "lower middle-income country" OR "lower middle income nation" OR "lower middle income</p>

nation" OR "upper middle-income country" OR "upper middle income country" OR "upper middle-income nation" OR "upper middle income nation" OR "low-income country" OR "low income country" OR "low-income nation" OR "low income nation" OR "lower income country" OR "lower-income country" OR "lower income nation" OR "lower-income nation" OR "lower middle income countries" OR "lower middle-income countries" OR "lower middle income nation" OR "lower middle-income nation" OR "upper middle-income countries" OR "upper middle income countries" OR "upper middle-income nation" OR "upper middle income nation" OR "low income countries" OR "low income countries" OR "low-income nation" OR "low income nation" OR "lower income countries" OR "lower-income countries" OR "lower income nation" OR "lower-income nation" OR "lmic" OR "lmics" OR "third world" OR "lami countr*" OR "transitional countr*" OR "majority world" OR "global south" OR "lmic" OR "lmics" OR "lic" OR "lics" OR "lmics" OR "lmic" OR "umics" OR "umic" OR "afghanistan" OR "burkina faso" OR "burundi" OR "central african republic" OR "chad" OR "congo, dem." OR "eritrea" OR "ethiopia" OR "gambia" OR "guinea-bissau" OR "korea, dem. people's rep" OR "liberia" OR "madagascar" OR "malawi" OR "mali" OR "mozambique" OR "niger" OR "rwanda" OR "sierra leone" OR "somalia" OR "south sudan" OR "sudan" OR "syrian arab republic" OR "togo" OR "uganda" OR "yemen, rep." OR "angola" OR "algeria" OR "bangladesh" OR "benin" OR "bhutan" OR "bolivia" OR "cabo verde" OR "cambodia" OR "cameroon" OR "comoros" OR "congo, rep." OR "cote d'ivoire" OR "djibouti" OR "egypt, arab rep." OR "eswatini" OR "ghana" OR "guinea" OR "haiti" OR "honduras" OR "jordan" OR "india" OR "iran, islamic rep" OR "kenya" OR "kiribati" OR "kyrgyz republic" OR "lao pdr" OR "lebanon" OR "lesotho" OR "mauritania" OR "micronesia, fed. sts." OR "mongolia" OR "morocco" OR "myanmar" OR "nepal" OR "nicaragua" OR "nigeria" OR "pakistan" OR "papua new guinea" OR "philippines" OR "samoa" OR "sao tome & principe" OR "senegal" OR "solomon islands" OR "sri lanka" OR "tanzania" OR "tajikistan" OR "timor-leste" OR "tunisia" OR "ukraine" OR "uzbekistan" OR "vanuatu" OR "vietnam" OR "zambia" OR "zimbabwe" OR "albania" OR "argentina" OR "armenia" OR "azerbaijan" OR "belarus" OR "belize" OR "bosnia" OR "herzegovina" OR "botswana" OR "brazil" OR "bulgaria" OR "china" OR "colombia" OR "costa rica" OR "cuba" OR "dominica" OR

	<p>"dominican republic" OR "el salvador" OR "equatorial guinea" OR "ecuador" OR "fiji" OR "gabon" OR "georgia" OR "grenada" OR "guatemala" OR "indonesia" OR "iraq" OR "jamaica" OR "kazakhstan" OR "kosovo" OR "libya" OR "malaysia" OR "maldives" OR "marshall islands" OR "mauritius" OR "mexico" OR "moldova" OR "montenegro" OR "namibia" OR "north macedonia" OR "palau" OR "paraguay" OR "peru" OR "russian federation" OR "serbia" OR "south africa" OR "st. lucia" OR "st. vincent" OR "suriname" OR "thailand" OR "tonga" OR "turkmenistan" OR "tuvalu" OR "west bank" OR "gaza"))</p>
PsychINFO	<p>S4 - S1 AND S2 AND S3 S3 - (TI(developing countr*) OR AB(developing countr*) OR TI(developing countries) OR AB(developing countries) OR TI(developing nation*) OR AB(developing nation*) OR TI(developing world) OR AB(developing world) OR TI(less-developed countr*) OR AB(less-developed countr*) OR TI(less developed countr*) OR AB(less developed countr*) OR TI(less-developed world) OR AB(less-developed world) OR TI(lesser developed world) OR AB(lesser developed world) OR TI(lesser-developed countr*) OR AB(lesser-developed countr*) OR TI(lesser developed countr*) OR AB(lesser developed countr*) OR TI(lesser-developed nation*) OR AB(lesser-developed nation*) OR TI(lesser developed nation*) OR AB(lesser developed nation*) OR TI(lesser-developed world) OR AB(lesser-developed world) OR TI(under-developed countr*) OR AB(under-developed countr*) OR TI(under developed countr*) OR AB(under developed countr*) OR TI(under-developed nation*) OR AB(under-developed nation*) OR TI(under developed nation*) OR AB(under developed nation*) OR TI(under-developed world) OR AB(under-developed world) OR TI(underdeveloped world) OR AB(underdeveloped world) OR TI(under developed world) OR AB(under developed world) OR TI(underdeveloped countr*) OR AB(underdeveloped countr*) OR TI(under-developed countr*) OR AB(under-developed countr*) OR TI(under developed countr*) OR AB(under developed countr*) OR TI(under developed nation*) OR AB(under developed nation*) OR TI(underdeveloped nation*) OR AB(underdeveloped nation*) OR TI(lower middle income country) OR AB(lower middle income country) OR TI(lower middle-income country) OR AB(lower middle-income country) OR TI(lower middle income nation) OR AB(lower middle</p>

income nation) OR TI(lower middle-income nation) OR AB(lower middle-income nation) OR TI(upper middle-income country) OR AB(upper middle-income country) OR TI(upper middle income country) OR AB(upper middle income country) OR TI(upper middle-income nation) OR AB(upper middle-income nation) OR TI(upper middle income nation) OR AB(upper middle income nation) OR TI(low-income country) OR AB(low-income country) OR TI(low income country) OR AB(low income country) OR TI(low-income nation) OR AB(low-income nation) OR TI(low income nation) OR AB(low income nation) OR TI(lower income country) OR AB(lower income country) OR TI(lower-income country) OR AB(lower-income country) OR TI(lower income nation) OR AB(lower income nation) OR TI(lower-income nation) OR AB(lower-income nation) OR TI(lmic) OR AB(lmic) OR TI(lmics) OR AB(lmics) OR TI(third world) OR AB(third world) OR TI(lami countr*) OR AB(lami countr*) OR TI(transitional countr*) OR AB(transitional countr*) OR TI(majority world) OR AB(majority world) OR TI(Global South) OR AB(Global South) OR TI(LMIC) OR AB(LMIC) OR TI(LMICs) OR AB(LMICs) OR TI(LIC) OR AB(LIC) OR TI(LICs) OR AB(LICs) OR TI(LMICs) OR AB(LMICs) OR TI(LMIC) OR AB(LMIC) OR TI(UMICs) OR AB(UMICs) OR TI(UMIC) OR AB(UMIC) OR TI(Afghanistan) OR AB(Afghanistan) OR TI(Burkina Faso) OR AB(Burkina Faso) OR TI(Burundi) OR AB(Burundi) OR TI(Central African Republic) OR AB(Central African Republic) OR TI(Chad) OR AB(Chad) OR TI(Congo, Dem.) OR AB(Congo, Dem.) OR TI(Eritrea) OR AB(Eritrea) OR TI(Ethiopia) OR AB(Ethiopia) OR TI(Gambia) OR AB(Gambia) OR TI(Guinea-Bissau) OR AB(Guinea-Bissau) OR TI(Korea, Dem. People's Rep) OR AB(Korea, Dem. People's Rep) OR TI(Liberia) OR AB(Liberia) OR TI(Madagascar) OR AB(Madagascar) OR TI(Malawi) OR AB(Malawi) OR TI(Mali) OR AB(Mali) OR TI(Mozambique) OR AB(Mozambique) OR TI(Niger) OR AB(Niger) OR TI(Rwanda) OR AB(Rwanda) OR TI(Sierra Leone) OR AB(Sierra Leone) OR TI(Somalia) OR AB(Somalia) OR TI(South Sudan) OR AB(South Sudan) OR TI(Sudan) OR AB(Sudan) OR TI(Syrian Arab Republic) OR AB(Syrian Arab Republic) OR TI(Togo) OR AB(Togo) OR TI(Uganda) OR AB(Uganda) OR TI(Yemen, Rep.) OR AB(Yemen, Rep.) OR TI(Angola) OR AB(Angola) OR TI(Algeria) OR AB(Algeria) OR TI(Bangladesh) OR AB(Bangladesh) OR TI(Benin) OR AB(Benin) OR TI(Bhutan) OR

AB(Bhutan) OR TI(Bolivia) OR AB(Bolivia) OR TI(Cabo Verde) OR
 AB(Cabo Verde) OR TI(Cambodia) OR AB(Cambodia) OR TI(Cameroon)
 OR AB(Cameroon) OR TI(Comoros) OR AB(Comoros) OR TI(Congo,
 Rep.) OR AB(Congo, Rep.) OR TI(Côte d'Ivoire) OR AB(Côte d'Ivoire)
 OR TI(Djibouti) OR AB(Djibouti) OR TI(Egypt, Arab Rep.) OR
 AB(Egypt, Arab Rep.) OR TI(Eswatini) OR AB(Eswatini) OR TI(Ghana)
 OR AB(Ghana) OR TI(Guinea) OR AB(Guinea) OR TI(Haiti) OR
 AB(Haiti) OR TI(Honduras) OR AB(Honduras) OR TI(Jordan) OR
 AB(Jordan) OR TI(India) OR AB(India) OR TI(Iran, Islamic Rep) OR
 AB(Iran, Islamic Rep) OR TI(Kenya) OR AB(Kenya) OR TI(Kiribati) OR
 AB(Kiribati) OR TI(Kyrgyz Republic) OR AB(Kyrgyz Republic) OR
 TI(Lao PDR) OR AB(Lao PDR) OR TI(Lebanon) OR AB(Lebanon) OR
 TI(Lesotho) OR AB(Lesotho) OR TI(Mauritania) OR AB(Mauritania) OR
 TI(Micronesia, Fed. Sts.) OR AB(Micronesia, Fed. Sts.) OR TI(Mongolia)
 OR AB(Mongolia) OR TI(Morocco) OR AB(Morocco) OR TI(Myanmar)
 OR AB(Myanmar) OR TI(Nepal) OR AB(Nepal) OR TI(Nicaragua) OR
 AB(Nicaragua) OR TI(Nigeria) OR AB(Nigeria) OR TI(Pakistan) OR
 AB(Pakistan) OR TI(Papua New Guinea) OR AB(Papua New Guinea) OR
 TI(Philippines) OR AB(Philippines) OR TI(Samoa) OR AB(Samoa) OR
 TI(São Tomé) OR AB(São Tomé) OR TI(Principe) OR AB(Principe) OR
 TI(Senegal) OR AB(Senegal) OR TI(Solomon Islands) OR AB(Solomon
 Islands) OR TI(Sri Lanka) OR AB(Sri Lanka) OR TI(Tanzania) OR
 AB(Tanzania) OR TI(Tajikistan) OR AB(Tajikistan) OR TI(Timor-Leste)
 OR AB(Timor-Leste) OR TI(Tunisia) OR AB(Tunisia) OR TI(Ukraine) OR
 AB(Ukraine) OR TI(Uzbekistan) OR AB(Uzbekistan) OR TI(Vanuatu) OR
 AB(Vanuatu) OR TI(Vietnam) OR AB(Vietnam) OR TI(Zambia) OR
 AB(Zambia) OR TI(Zimbabwe) OR AB(Zimbabwe) OR TI(Albania) OR
 AB(Albania) OR TI(Argentina) OR AB(Argentina) OR TI(Armenia) OR
 AB(Armenia) OR TI(Azerbaijan) OR AB(Azerbaijan) OR TI(Belarus) OR
 AB(Belarus) OR TI(Belize) OR AB(Belize) OR TI(Bosnia) OR
 AB(Bosnia) OR TI(Herzegovina) OR AB(Herzegovina) OR TI(Botswana)
 OR AB(Botswana) OR TI(Brazil) OR AB(Brazil) OR TI(Bulgaria) OR
 AB(Bulgaria) OR TI(China) OR AB(China) OR TI(Colombia) OR
 AB(Colombia) OR TI(Costa Rica) OR AB(Costa Rica) OR TI(Cuba) OR
 AB(Cuba) OR TI(Dominica) OR AB(Dominica) OR TI(Dominican
 Republic) OR AB(Dominican Republic) OR TI(El Salvador) OR AB(El
 Salvador) OR TI(Equatorial Guinea) OR AB(Equatorial Guinea) OR

TI(Ecuador) OR AB(Ecuador) OR TI(Fiji) OR AB(Fiji) OR TI(Gabon) OR
 AB(Gabon) OR TI(Georgia) OR AB(Georgia) OR TI(Grenada) OR
 AB(Grenada) OR TI(Guatemala) OR AB(Guatemala) OR TI(Indonesia)
 OR AB(Indonesia) OR TI(Iraq) OR AB(Iraq) OR TI(Jamaica) OR
 AB(Jamaica) OR TI(Kazakhstan) OR AB(Kazakhstan) OR TI(Kosovo) OR
 AB(Kosovo) OR TI(Libya) OR AB(Libya) OR TI(Malaysia) OR
 AB(Malaysia) OR TI(Maldives) OR AB(Maldives) OR TI(Marshall
 Islands) OR AB(Marshall Islands) OR TI(Mauritius) OR AB(Mauritius)
 OR TI(Mexico) OR AB(Mexico) OR TI(Moldova) OR AB(Moldova) OR
 TI(Montenegro) OR AB(Montenegro) OR TI(Namibia) OR AB(Namibia)
 OR TI(North Macedonia) OR AB(North Macedonia) OR TI(Palau) OR
 AB(Palau) OR TI(Paraguay) OR AB(Paraguay) OR TI(Peru) OR AB(Peru)
 OR TI(Russian Federation) OR AB(Russian Federation) OR TI(Serbia) OR
 AB(Serbia) OR TI(South Africa) OR AB(South Africa) OR TI(St. Lucia)
 OR AB(St. Lucia) OR TI(St. Vincent) OR AB(St. Vincent) OR
 TI(Suriname) OR AB(Suriname) OR TI(Thailand) OR AB(Thailand) OR
 TI(Tonga) OR AB(Tonga) OR TI(Türkiye) OR AB(Türkiye) OR
 TI(Turkmenistan) OR AB(Turkmenistan) OR TI(Tuvalu) OR AB(Tuvalu)
 OR TI(West Bank) OR AB(West Bank) OR TI(Gaza))
 S2 - (TI(Community health care worker*) OR AB(Community health care
 worker*) OR TI(CHW*) OR AB(CHW*) OR TI(Community health
 worker*) OR AB(Community health worker*) OR TI(Front line health
 worker*) OR AB(Front line health worker*) OR TI(Outreach worker*) OR
 AB(Outreach worker*) OR TI(Lay health worker*) OR AB(Lay health
 worker*) OR TI(Lay counsellor*) OR AB(Lay counsellor*) OR TI(Health
 promoter*) OR AB(Health promoter*) OR TI(Village health worker*) OR
 AB(Village health worker*) OR TI(Volunteer health worker*) OR
 AB(Volunteer health worker*) OR TI(Community volunteer*) OR
 AB(Community volunteer*) OR TI(Village health volunteer*) OR
 AB(Village health volunteer*) OR TI(Lady health worker*) OR AB(Lady
 health worker*) OR TI(Barangay health worker*) OR AB(Barangay health
 worker*) OR TI(Outreach educator*) OR AB(Outreach educator*) OR
 TI(Shas*) OR AB(Shas*) OR TI(Shebika) OR AB(Shebika) OR
 TI(Shastho karmis) OR AB(Shastho karmis) OR TI(Village health helper*)
 OR AB(Village health helper*) OR TI(Accredited Social Health Activist,
 ASHA) OR AB(Accredited Social Health Activist, ASHA) OR TI(Family
 Health Worker*) OR AB(Family Health Worker*) OR TI(Peer Educator*)

	<p>OR AB(Peer Educator*)) S1 - (TI(e-learning) OR AB(e-learning) OR TI(elearning) OR AB(elearning) OR TI(Electronic learning) OR AB(Electronic learning) OR TI(Online learning) OR AB(Online learning) OR TI(Distance learning) OR AB(Distance learning) OR TI(Massive Open Online Course) OR AB(Massive Open Online Course) OR TI(MOOC) OR AB(MOOC) OR TI(Mobile learning) OR AB(Mobile learning) OR TI(m-learning) OR AB(m-learning) OR TI(mlearning) OR AB(mlearning) OR TI(Webbased) OR AB(Webbased) OR TI(Web-based) OR AB(Web-based) OR TI(Offline learning) OR AB(Offline learning) OR TI(Offline distance learning) OR AB(Offline distance learning) OR TI(Technology enhanced learning) OR AB(Technology enhanced learning) OR TI(Digital innovations) OR AB(Digital innovations) OR TI(Hybrid learning) OR AB(Hybrid learning) OR TI(Flipped learning) OR AB(Flipped learning) OR TI(Blended education) OR AB(Blended education) OR TI(Multi-model learning) OR AB(Multi-model learning) OR TI(Hyflex learning) OR AB(Hyflex learning) OR TI(Asynchronous learning) OR AB(Asynchronous learning))</p>
EMBASE	<p>#4 - #1 AND #2 AND #3 #3 - 'developing countr*':ab,ti OR 'developing countries':ab,ti OR 'developing nation*':ab,ti OR 'developing world':ab,ti OR 'less-developed countr*':ab,ti OR 'less developed countr*':ab,ti OR 'less-developed world':ab,ti OR 'lesser developed world':ab,ti OR 'lesser-developed countr*':ab,ti OR 'lesser developed countr*':ab,ti OR 'lesser-developed nation*':ab,ti OR 'lesser developed nation*':ab,ti OR 'lesser-developed world':ab,ti OR 'under-developed nation*':ab,ti OR 'under-developed world':ab,ti OR 'underdeveloped world':ab,ti OR 'under developed world':ab,ti OR 'underdeveloped countr*':ab,ti OR 'under-developed countr*':ab,ti OR 'under developed countr*':ab,ti OR 'under developed nation*':ab,ti OR 'underdeveloped nation*':ab,ti OR 'lower middle income country':ab,ti OR 'lower middle-income country':ab,ti OR 'upper middle- income country':ab,ti OR 'upper middle income country':ab,ti OR 'low- income country':ab,ti OR 'low income country':ab,ti OR 'lower income country':ab,ti OR 'lower-income country':ab,ti OR 'lower middle income countries':ab,ti OR 'lower middle-income countries':ab,ti OR 'lower middle income nation':ab,ti OR 'lower middle-income nation':ab,ti OR 'upper middle-income countries':ab,ti OR 'upper middle income countries':ab,ti OR 'upper middle-income nation':ab,ti OR 'upper middle income</p>

nation':ab,ti OR 'low income countries':ab,ti OR 'low-income nation':ab,ti
 OR 'low income nation':ab,ti OR 'lower income countries':ab,ti OR 'lower-
 income countries':ab,ti OR 'lower income nation':ab,ti OR 'lower-income
 nation':ab,ti OR 'third world':ab,ti OR 'lami countr*':ab,ti OR 'transitional
 countr*':ab,ti OR 'majority world':ab,ti OR 'global south':ab,ti OR 'lic':ab,ti
 OR 'lics':ab,ti OR 'lmics':ab,ti OR 'lmic':ab,ti OR 'umics':ab,ti OR
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 OR 'central african republic':ab,ti OR 'chad':ab,ti OR 'congo dem.':ab,ti OR
 'eritrea':ab,ti OR 'ethiopia':ab,ti OR 'gambia':ab,ti OR 'guinea bissau':ab,ti
 OR 'korea dem peoples rep':ab,ti OR 'liberia':ab,ti OR 'madagascar':ab,ti
 OR 'malawi':ab,ti OR 'mali':ab,ti OR 'mozambique':ab,ti OR 'niger':ab,ti
 OR 'rwanda':ab,ti OR 'sierra leone':ab,ti OR 'somalia':ab,ti OR 'south
 sudan':ab,ti OR 'sudan':ab,ti OR 'syrian arab republic':ab,ti OR 'togo':ab,ti
 OR 'uganda':ab,ti OR 'yemen rep.':ab,ti OR 'angola':ab,ti OR 'algeria':ab,ti
 OR 'bangladesh':ab,ti OR 'benin':ab,ti OR 'bhutan':ab,ti OR 'bolivia':ab,ti
 OR 'cabo verde':ab,ti OR 'cambodia':ab,ti OR 'cameroon':ab,ti OR
 'comoros':ab,ti OR 'congo rep.':ab,ti OR 'côte divoire':ab,ti OR
 'djibouti':ab,ti OR 'egypt arab rep.':ab,ti OR 'eswatini':ab,ti OR 'ghana':ab,ti
 OR 'guinea':ab,ti OR 'haiti':ab,ti OR 'honduras':ab,ti OR 'jordan':ab,ti OR
 'india':ab,ti OR 'iran islamic rep':ab,ti OR 'kenya':ab,ti OR 'kiribati':ab,ti
 OR 'kyrgyz republic':ab,ti OR 'lao pdr':ab,ti OR 'lebanon':ab,ti OR
 'lesotho':ab,ti OR 'mauritania':ab,ti OR 'micronesia, fed. sts.':ab,ti OR
 'mongolia':ab,ti OR 'morocco':ab,ti OR 'myanmar':ab,ti OR 'nepal':ab,ti OR
 'nicaragua':ab,ti OR 'nigeria':ab,ti OR 'pakistan':ab,ti OR 'papua new
 guinea':ab,ti OR 'philippines':ab,ti OR 'samoa':ab,ti OR 'são tomé':ab,ti OR
 'principe':ab,ti OR 'senegal':ab,ti OR 'solomon islands':ab,ti OR 'sri
 lanka':ab,ti OR 'tanzania':ab,ti OR 'tajikistan':ab,ti OR 'timor leste':ab,ti OR
 'tunisia':ab,ti OR 'ukraine':ab,ti OR 'uzbekistan':ab,ti OR 'vanuatu':ab,ti OR
 'vietnam':ab,ti OR 'zambia':ab,ti OR 'zimbabwe':ab,ti OR 'albania':ab,ti OR
 'argentina':ab,ti OR 'armenia':ab,ti OR 'azerbaijan':ab,ti OR 'belarus':ab,ti
 OR 'belize':ab,ti OR 'bosnia':ab,ti OR 'herzegovina':ab,ti OR
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 'colombia':ab,ti OR 'costa rica':ab,ti OR 'cuba':ab,ti OR 'dominica':ab,ti OR
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 OR 'ecuador':ab,ti OR 'fiji':ab,ti OR 'gabon':ab,ti OR 'georgia':ab,ti OR
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 'jamaica':ab,ti OR 'kazakhstan':ab,ti OR 'kosovo':ab,ti OR 'libya':ab,ti OR

	<p>'malaysia':ab,ti OR 'maldives':ab,ti OR 'marshall islands':ab,ti OR 'mauritius':ab,ti OR 'mexico':ab,ti OR 'moldova':ab,ti OR 'montenegro':ab,ti OR 'namibia':ab,ti OR 'north macedonia':ab,ti OR 'palau':ab,ti OR 'paraguay':ab,ti OR 'peru':ab,ti OR 'russian federation':ab,ti OR 'serbia':ab,ti OR 'south africa':ab,ti OR 'st lucia':ab,ti OR 'st vincent':ab,ti OR 'suriname':ab,ti OR 'thailand':ab,ti OR 'tonga':ab,ti OR 'türkiye':ab,ti OR 'turkmenistan':ab,ti OR 'tuvalu':ab,ti OR 'west bank':ab,ti OR 'gaza':ab,ti #2 - 'community health care worker*':ab,ti OR 'chw*':ab,ti OR 'community health worker*':ab,ti OR 'front line health worker*':ab,ti OR 'outreach worker*':ab,ti OR 'lay health worker*':ab,ti OR 'lay counsellor*':ab,ti OR 'health promoter*':ab,ti OR 'village health worker*':ab,ti OR 'volunteer health worker*':ab,ti OR 'community volunteer*':ab,ti OR 'village health volunteer*':ab,ti OR 'lady health worker*':ab,ti OR 'barangay health worker*':ab,ti OR 'outreach educator*':ab,ti OR 'shas*':ab,ti OR 'shebika':ab,ti OR 'shastho karmis':ab,ti OR 'village health helper*':ab,ti OR 'accredited social health activist, asha':ab,ti OR 'family health worker*':ab,ti OR 'peer educator*':ab,ti #1 - 'virtual learning':ab,ti OR 'e-learning':ab,ti OR 'elearning':ab,ti OR 'electronic learning':ab,ti OR 'online learning':ab,ti OR 'distance learning':ab,ti OR 'massive open online course':ab,ti OR 'mooc':ab,ti OR 'mobile learning':ab,ti OR 'm-learning':ab,ti OR 'mlearning':ab,ti OR 'webbased':ab,ti OR 'web-based':ab,ti OR 'offline learning':ab,ti OR 'offline distance learning':ab,ti OR 'technology enhanced learning':ab,ti OR 'digital innovations':ab,ti OR 'hybrid learning':ab,ti OR 'flipped learning':ab,ti OR 'blended education':ab,ti OR 'multi-model learning':ab,ti OR 'hyflex learning':ab,ti OR 'asynchronous learning':ab,ti</p>
<p>ERIC</p> <p>https://preprints.jmir.org/preprint/82772</p>	<p>S4 - S1 AND S2 AND S3 S3 - ("developing countr*" OR "developing countries" OR "developing nation*" OR "developing world" OR "less-developed countr*" OR "less developed countr*" OR "less-developed world" OR "lesser developed world" OR "lesser-developed countr*" OR "lesser developed countr*" OR "lesser-developed nation*" OR "lesser developed nation*" OR "lesser-developed world" OR "under-developed countr*" OR "under developed countr*" OR "under-developed nation*" OR "under developed nation*" OR "under-developed world" OR "underdeveloped world" OR "under developed world" OR "underdeveloped countr*" OR "under-developed countr*" OR "Under developed countr*" OR "under developed nation*"</p>

OR "underdeveloped nation*" OR "lower middle income country" OR "lower middle-income country" OR "lower middle income nation" OR "lower middle income nation" OR "upper middle-income country" OR "upper middle income country" OR "upper middle-income nation" OR "upper middle income nation" OR "low-income country" OR "low income country" OR "low-income nation" OR "low income nation" OR "lower income country" OR "lower-income country" OR "lower income nation" OR "lower-income nation" OR "lower middle income countries" OR "lower middle-income countries" OR "lower middle income nation" OR "lower middle-income nation" OR "upper middle-income countries" OR "upper middle income countries" OR "upper middle-income nation" OR "upper middle income nation" OR "low income countries" OR "low income countries" OR "low-income nation" OR "low income nation" OR "lower income countries" OR "lower-income countries" OR "lower income nation" OR "lower-income nation" OR "lmic" OR "lmics" OR "third world" OR "lami countr*" OR "transitional countr*" OR "majority world" OR "Global South" OR "LMIC" OR "LMICs" OR "LIC" OR "LICs" OR "LMICs" OR "LMIC" OR "UMICs" OR "UMIC" OR "Afghanistan" OR "Burkina Faso" OR "Burundi" OR "Central African Republic" OR "Chad" OR "Congo, Dem." OR "Eritrea" OR "Ethiopia" OR "Gambia" OR "Guinea-Bissau" OR "Korea, Dem. People's Rep" OR "Liberia" OR "Madagascar" OR "Malawi" OR "Mali" OR "Mozambique" OR "Niger" OR "Rwanda" OR "Sierra Leone" OR "Somalia" OR "South Sudan" OR "Sudan" OR "Syrian Arab Republic" OR "Togo" OR "Uganda" OR "Yemen, Rep." OR "Angola" OR "Algeria" OR "Bangladesh" OR "Benin" OR "Bhutan" OR "Bolivia" OR "Cabo Verde" OR "Cambodia" OR "Cameroon" OR "Comoros" OR "Congo, Rep." OR "Côte d'Ivoire" OR "Djibouti" OR "Egypt, Arab Rep." OR "Eswatini" OR "Ghana" OR "Guinea" OR "Haiti" OR "Honduras" OR "Jordan" OR "India" OR "Iran, Islamic Rep" OR "Kenya" OR "Kiribati" OR "Kyrgyz Republic" OR "Lao PDR" OR "Lebanon" OR "Lesotho" OR "Mauritania" OR "Micronesia, Fed. Sts." OR "Mongolia" OR "Morocco" OR "Myanmar" OR "Nepal" OR "Nicaragua" OR "Nigeria" OR "Pakistan" OR "Papua New Guinea" OR "Philippines" OR "Samoa" OR "São Tomé" OR "Principe" OR "Senegal" OR "Solomon Islands" OR "Sri Lanka" OR "Tanzania" OR "Tajikistan" OR "Timor-Leste" OR "Tunisia" OR "Ukraine" OR "Uzbekistan" OR "Vanuatu" OR "Vietnam" OR "Zambia" OR "Zimbabwe" OR "Albania"

OR "Argentina" OR "Armenia" OR "Azerbaijan" OR "Belarus" OR "Belize" OR "Bosnia" OR "Herzegovina" OR "Botswana" OR "Brazil" OR "Bulgaria" OR "China" OR "Colombia" OR "Costa Rica" OR "Cuba" OR "Dominica" OR "Dominican Republic" OR "El Salvador" OR "Equatorial Guinea" OR "Ecuador" OR "Fiji" OR "Gabon" OR "Georgia" OR "Grenada" OR "Guatemala" OR "Indonesia" OR "Iraq" OR "Jamaica" OR "Kazakhstan" OR "Kosovo" OR "Libya" OR "Malaysia" OR "Maldives" OR "Marshall Islands" OR "Mauritius" OR "Mexico" OR "Moldova" OR "Montenegro" OR "Namibia" OR "North Macedonia" OR "Palau" OR "Paraguay" OR "Peru" OR "Russian Federation" OR "Serbia" OR "South Africa" OR "St. Lucia" OR "St. Vincent" OR "Suriname" OR "Thailand" OR "Tonga" OR "Türkiye" OR "Turkmenistan" OR "Tuvalu" OR "West Bank" OR "Gaza")

S2 - ("Community health care worker*" OR "CHW*" OR "Community health worker*" OR "Front line health worker*" OR "Outreach worker*" OR "Lay health worker*" OR "Lay counsellor*" OR "Health promoter*" OR "Village health worker*" OR "Volunteer health worker*" OR "Community volunteer*" OR "Village health volunteer*" OR "Lady health worker*" OR "Barangay health worker*" OR "Outreach educator*" OR "Shas*" OR "Shebika" OR "Shastho karmis" OR "Village health helper*" OR "Accredited Social Health Activist, ASHA" OR "Family Health Worker*" OR "Peer Educator*")

S1 - ("Virtual learning" OR "e-learning" OR "elearning" OR "Electronic learning" OR "Online learning" OR "Distance learning" OR "Massive Open Online Course" OR "MOOC" OR "Mobile learning" OR "m-learning" OR "mlearning" OR "Webbased" OR "Web-based" OR "Offline learning" OR "Offline distance learning" OR "Technology enhanced learning" OR "Digital innovations" OR "Hybrid learning" OR "Flipped learning" OR "Blended education" OR "Multi-model learning" OR "Hyflex learning" OR "Asynchronous learning")

Global Health ((("developing countr*" OR "developing nation*" OR "developing world" OR "less* developed countr*" OR "underdeveloped countr*" OR "low-income countr*" OR "lower-middle-income countr*" OR "upper-middle-income countr*" OR LMIC OR LMICs OR LIC OR LICs OR UMIC OR UMICs OR "third world" OR "Global South" OR "resource-limited setting*" OR "emerging econom*" OR Afghanistan OR "Burkina Faso" OR Burundi OR "Central African Republic" OR Chad OR Eritrea OR

Ethiopia OR Gambia OR Malawi OR Mozambique OR Niger OR Rwanda OR Somalia OR Sudan OR Togo OR Uganda OR "Yemen, Rep." OR Angola OR Algeria OR Bangladesh OR Bhutan OR Bolivia OR Cambodia OR Cameroon OR Djibouti OR Egypt OR Ghana OR Guinea OR Haiti OR India OR Indonesia OR Kenya OR Nigeria OR Pakistan OR Philippines OR Senegal OR Tanzania OR Ukraine OR Zambia OR Zimbabwe OR Albania OR Argentina OR Armenia OR Brazil OR China OR Colombia OR Mexico OR "South Africa" OR Thailand OR Türkiye)) AND ((("Community health care worker" OR CHW OR "Community health worker" OR "Front line health worker" OR "Outreach worker" OR "Lay health worker" OR "Lay counsellor" OR "Health promoter" OR "Village health worker" OR "Volunteer health worker" OR "Community volunteer" OR "Village health volunteer" OR "Lady health worker" OR "Barangay health worker" OR "Outreach educator" OR Shas OR Shebika OR "Shastho karmis" OR "Village health helper" OR "Accredited Social Health Activist" OR ASHA OR "Family Health Worker" OR "Peer Educator")) AND ((("Virtual learning" OR "e-learning" OR elearning OR "Electronic learning" OR "Online learning" OR "Distance learning" OR "Massive Open Online Course" OR MOOC OR "Mobile learning" OR "m-learning" OR mlearning OR Webbased OR "Web-based" OR "Offline learning" OR "Offline distance learning" OR "Technology enhanced learning" OR "Digital innovations" OR "Hybrid learning" OR "Flipped learning" OR "Blended education" OR "Multi-model learning" OR "Hyflex learning" OR "Asynchronous learning"))

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((("Virtual learning" OR "e-learning" OR "elearning" OR "Electronic learning" OR "Online learning" OR "Distance learning" OR "Massive Open Online Course" OR "MOOC" OR "Mobile learning" OR "m-learning" OR "mlearning" OR "Webbased" OR "Web-based" OR "Offline learning" OR "Offline distance learning" OR "Technology enhanced learning" OR "Digital innovations" OR "Hybrid learning" OR "Flipped learning" OR "Blended education" OR "Multi-modal learning" OR "Hyflex learning" OR "Asynchronous learning" OR "Digital Training" OR "Digital learning" OR "Virtual training" OR "Online education" OR "Remote training")) AND ((("Community health care worker" OR "CHW" OR "Community health worker" OR "Frontline health worker" OR "Outreach worker" OR "Lay health worker" OR "Lay counsellor" OR "Health promoter" OR "Village health worker" OR "Volunteer health worker" OR

	"Community volunteer" OR "Village health volunteer" OR "Lady health worker" OR "Barangay health worker" OR "Outreach educator" OR "Shas" OR "Shebika" OR "Shastho karmis" OR "Village health helper" OR "Accredited Social Health Activist" OR "ASHA" OR "Family Health Worker" OR "Peer Educator" OR "Health extension worker" OR "Community outreach worker" OR "Village volunteer")) in Title Abstract Keyword - in Cochrane Reviews, Cochrane Protocols, Trials, Clinical Answers, Editorials, Special Collections
GOOGLE SCHOLAR	allintitle:(("blended learning" OR "digital training" OR "e learning" OR "online courses" OR webinars) AND ("lay health care worker" OR "health provider" OR "health worker" OR "health volunteers" OR "community health worker" OR "health extension workers" OR "health care" OR "primary health care worker" OR "primary care provider" OR "public health worker" OR "lay health worker" OR "peer support worker" OR "lay counselor" OR "community health aide" OR "health promoter" OR "frontline health worker" OR "village health worker" OR "lady health worker" OR "barefoot doctor" OR "health educator" OR "health facilitator" OR "health advisor" OR "health navigator" OR "health liaison" OR "outreach worker" OR "health assistant" OR "health guide"))
SSRN	("Blended learning" OR "e-learning") AND ("Health")

Supplementary Table 2. Individual database search results

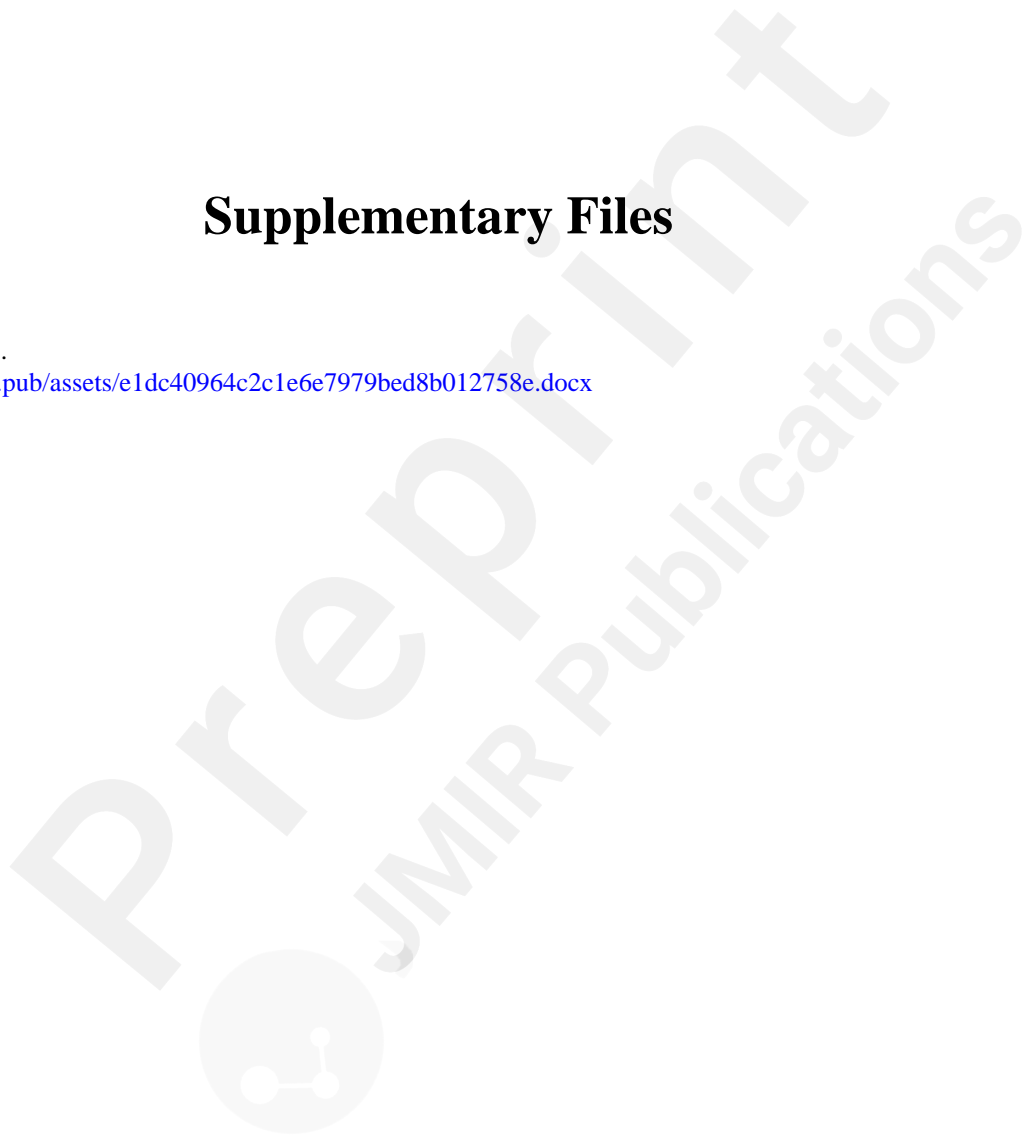
Database	Number of hits	Page number for search strategy details
PubMed	48	1-4
CINHAL	18	4-7
SCOPUS	92	7-9
PsychINFO	23	9-12
EMBASE	61	12-14
ERIC	27	14-16
Global Health	23	16
COCHRANE	34	16-17
GOOGLE SCHOLAR	361	17
SSRN	12	17

Legend: The results from individual database searches, including the number of hits and the supplementary material page numbers where the search strategies can be found.

Supplementary Files

Supplementary Tables.

URL: <http://asset.jmir.pub/assets/e1dc40964c2c1e6e7979bed8b012758e.docx>



CONSORT (or other) checklists

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist.
URL: <http://asset.jmir.pub/assets/104308895bec0ad55e01d3804cbdb546.pdf>