

Interventions to Improve Provider Competence in Low-and-Middle-Income Countries (LMICs): A Scoping Review

Caitlin Salloum

Johns Hopkins University Bloomberg School of Public Health

Cameron Feil (✉ cfeil@worldbank.org)

World Bank Group <https://orcid.org/0000-0002-9689-7240>

Marwa Ramadan

World Bank Group

Manuela Villar Uribe

World Bank Group

Research

Keywords: Primary health care, health personnel, health workforce, developing countries, quality improvement, education, health services, quality of health care, clinical competence

Posted Date: November 29th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-2289374/v1>

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Abstract

Background: Despite a global movement to strengthen primary health care systems, quality of care often remains poor across low-and-middle-income countries. A key determinant for quality of care is provider competence. This scoping review specifically aims to build on the Health Care Provider Performance Review (HCPPR), a systematic review of interventions to improve health care performance in low-and-middle-income countries, by identifying the approaches, effect, and characteristics of successful provider competence interventions at the PHC level.

Methods: PubMed, Scopus, and Embase were used to search for peer-reviewed publications and grey literature that reported evidence of interventions to improve provider competence in PHC settings in LMICs.

Results: A total of 37 articles met the inclusion criteria. Three themes were identified: education and training, supervision and mentorship, and protocols and tools. Most studies included in the review took place in Sub-Saharan Africa (60 %) and in lower-middle income countries (57 %). Among the 37 articles, 27 (73 %) utilized an education and training intervention, 18 (48 %) utilized a supervision and mentoring intervention, and 15 (41 %) utilized a protocol and tool intervention. A total of 19 (51%) interventions were multicomponent, containing more than one intervention theme. Most interventions reported positive outcomes, although few presented evidence on the long-term impacts of the interventions. Among the three themes, education and training interventions reported more successful interventions compared to supervision and mentoring or protocol and tool-based interventions. Multicomponent interventions reported the most favorable outcomes compared to independent interventions.

Conclusion: Provider competence interventions, when appropriately planned, implemented, and sustained are effective for improving the skills, knowledge, and competence of providers in LMICs. When feasible, interventions that combine multiple approaches consistently show to have the greatest short- and long-term effects on the competence of providers. However, despite the available research, there is still a lack of evidence on adapting, implementing, and sustaining interventions to improve provider competence across contexts.

Background

The importance of primary health care (PHC) is a critical strategy to both improve population health and healthcare system performance (1). The importance of strong PHC systems is reflected in the Sustainable Development Goals and are considered an essential component for achieving Universal Healthcare Coverage (2-8). The 2018 Astana Declaration reaffirmed the role of PHC in achieving UHC, defining PHC as “a triad of multisectoral policies to promote health, engaged communities to promote health and integrated clinical and public health services to deliver better primary care” (1,9).

Despite the increased focus on PHC, the performance of PHC systems in low- and middle-income countries (LMICs) is generally poor (1). Substantial improvements in PHC systems and service delivery

are critical for countries to meet the SDGs and achieve UHC (1). There is a need to increase the level of PHC research in LMICs, specifically in understanding the linkages between service delivery functions and improvements in population health outcomes (1).

Achieving UHC through strong primary health care requires a paradigm shift from measuring the level of *service coverage* to the level of *effective service coverage*, defined as “the proportion of people in need of health services who receive services of sufficient quality to obtain potential health gains” (1,20). The effectiveness of services is highly contingent on the competence of providers. (11). However, understanding the competence of providers is challenging in practice, as it requires measuring the specific actions of providers during the service delivery process (8).

Accessing health care services has significantly improved over the past two decades across LMICs due in large part to a greater availability of health care workers and infrastructure. However, the impact greater access on the health of populations has not been maximized because of the limited availability of competent health providers (19). Many health care providers are aware of clinical guidelines but fail to translate their knowledge into practice, widely known as the “know-do” gap (21-25). The impacts of increased access to health services have not been equitably distributed across LMICs, as more competent medical providers tend to serve higher-income populations across LMICs (8-11, 19). It is therefore critical to help health system stakeholder understanding how to best improve the competence of health providers to ensure that the services delivered are effective (11). Provider competence refers to having and demonstrating the “knowledge, traits, skills, and abilities” to deliver quality services successfully and effectively and is causally related to job performance (11). Knowledge involves an awareness and understanding of facts and procedures (11). Traits are distinguishing characteristics or qualities that predispose an individual to respond or behave in a particular way (11). Skills refers to “actions (and reactions) that an individual performs in a competent way to achieve a goal” (12). Abilities include the power or capacity to act in a certain way or do something (11).

This review builds on Health Care Provider Performance Review (HCPPR), a systematic review of interventions to improve health care performance in LMICs (26). This scoping review aims to build on the HCPPR by specifically determining the approaches used to deliver provider competence interventions at the *PHC level* in LMICs. Additionally, this scoping review identifies important themes within provider competence interventions, along with the determinants of these programs’ successful implementation. In completing these aims, this scoping review hopes to identify key concepts, research gaps, and evidence to inform future provider competence programs, policies, and research.

Methods

The scoping review sought to address the following questions:

1. What are the approaches to improve provider competence in PHC settings in LMICs?

2. What existing evidence is there on the effectiveness of these interventions?
3. What are key characteristics of successful interventions to improve provider competence?

PubMed, Scopus, and Embase were used to identify peer-reviewed literature. The search strategy included articles with at least one term from each concept.(Table 1). Full search strategies for each database (PubMed, Scopus, and Embase) can be found in the Supplementary File 1. LMICs were defined by the World Bank’s economic classification of low, lower-middle, or upper-middle income. No specific definition of PHC services was utilized, but the study encompassed PHC services that were provided within facility-based care across health system levels. The population of interest did include the wider primary health care workforce, including physicians, nurses, and community health care workers (secondary level providers such as specialists were excluded) etc. Selected outcome measures included in the search strategy were those identified in and preliminary review of provider competence literature.

Table 1: Search Strategy Terms

Search Concepts	Search Terms
Setting	low- and middle-income countries (full strategy available in supplementary information file 1)
Context	primary health care; care, primary health; health care, primary; primary healthcare; healthcare, primary; primary health care; primary care; care, primary; primary care doctor*; primary care physician*; family practice*; practice, family; family practitioner*; general practice*; practice, general; general practitioner*; family medicine; family doctor*; family physician*
Population	health workforce; workforce, health; health occupations manpower; manpower, health; health manpower; workforce
Outcomes	quality of health care; clinical competence; guideline adherence; quality assurance, health care; guidelines as topic; health care and quality; healthcare quality; quality improv*; quality assurance; provider competence

Article inclusion was based on the type of intervention implemented in a primary care context in a low- and middle-income country and the assessed outcome. Documents selected were inclusive of various research methodologies (i.e. quantitative, qualitative, mixed-methods, etc.). No time restrictions were applied. Protocols, Letters to the Editor, Response to Authors, short editorial articles and short commentary pieces that did not report data, and articles not in English were excluded.

Table 2: Inclusion and Exclusion Criteria

Inclusion Criteria	<ul style="list-style-type: none"> • Setting: LMICs • Context: PHC • Population: Health workforce • Outcome: Studies evaluating interventions to improve provider competence, which can be measured through clinical/provider competence, health care quality, guideline adherence, knowledge/skills/abilities/traits • Study design: All • Publication date: All
Exclusion Criteria	<ul style="list-style-type: none"> • Any study that does not meet the stated inclusion criteria • Protocols, letters, editorials, responses, and commentaries with no reported data • Articles not in English

The study review and synthesis were conducted in two stages. In the first stage, the results of the three database searches were input into Covidence, the Cochrane Community’s screening and data extraction tool, where duplicates across databases were removed. The titles and abstracts of the initial search results were screened and assessed for relevance based on the inclusion criteria, and those which did not meet the inclusion criteria were removed. The full text of the remaining publications was retrieved and reviewed. Those that did not meet the inclusion criteria after full-text review were not included. Reference lists of the included articles were hand-searched for additional sources. The included publications within systematic reviews/meta-analyses that met inclusion criteria after full-text screening were hand-searched as standalone sources.

In the second stage, the full-text publications were reviewed to identify study characteristics (i.e., study design, country, duration), intervention type, presence of co- or multi-interventions, outcomes, and impacts. The outcomes included the specific measure of interest to this scoping review, though more outcomes may have been assessed as indicated by the asterisk (*) in later tables. The impact detailed the results of the intervention and implications for the body of literature on interventions to improve provider competence in PHC settings in LMICs. Additionally, within this stage, the interventions were grouped into categories that were derived from the conceptual framework that was identified from the Primary Health Care Performance Initiative (PHCPI) (8).

A total of 37 articles were included for review, 19 of which were included from previous reviews, and 18 of which were new studies identified from the selected databases. Figure 1 below presents an overview of the evidence identification, screening, and inclusion process.

The studies included in this scoping review were grouped into general topic areas based on the applied frameworks for provider competence from PHCPI and the results of the literature search. Three categories of literature emerged: (1) education and training, (2) supervision and mentoring, and (3) protocols and tools (Table 3). In cases where an article had implemented multiple intervention strategies that had overlap between categories, the article was included in each of the relevant subsequent theme tables and annotated. A section for multi-component interventions is included to distinguish the evidence between single- and multi-component interventions.

We categorized the outcome measures based on the "know-do" gap. The "know-do" gap demonstrates that many providers are trained and aware of standards of care but fail to follow this knowledge when consulting with patients (21-25). For each of the selected studies, we determined if the outcome measured providers knowledge (including written tests, vignettes, and clinical records reviews) or the providers practice (observations, clinical data, and fake patients). Distinguishing if provider competence interventions success is evaluated based on the level of provider knowledge or application of knowledge to practice has implications on the validity of the intervention. Considering that many providers fail to implement their knowledge (21-25), it is critical that the effect of the intervention be demonstrated in practice.

Results

Among the 37 studies included in the scoping review, 27 (73%) studies implemented education and training interventions, 18 studies (48%) implemented supervision and mentoring interventions, and 15 (40%) implemented protocol and tool-based interventions (See Table 3). Fifteen studies (40%) implemented multiple intervention strategies with overlap between categories. Geographically, most of the selected studies took place in Sub-Saharan Africa (59%), while 19% were implemented in South Asia and 14% in the Middle East and North Africa. Among World Bank Income level classifications, most of the identified provider competence interventions took place in lower-middle income countries (57%), followed by low-income countries (19%) and upper-middle income countries (16%). Three publications evaluated interventions in more than one country spanning multiple income levels: Kohrt et al., (2018), Nogaro et al., (2015), and Peter et al. (2016). The earliest paper selected for review was published in 1993. The total number of provider competence interventions published from 1993 to 2005 was limited. From 2006 onwards, however, the number of published provider competence interventions studies in LMICs increased significantly (Table 2). Supplementary File 2 contains a complete overview of the studies by economic classification, methodology, region, and theme, and Supplementary Files 3 contains overview of each included study by theme.

Table 2: Scoping Review Included Studies by Theme

Author	Year	Education & Training	Supervision & Mentoring	Protocols & Tools
Getachew et al.	2021	X	X	X
Bhura et al.	2020			X
Daud et al.	2020	X	X	X
Tawfiq et al.	2020	X		X
Alwawi et al.	2019	X		
Argaw et al.	2019		X	X
Larson et al.	2019		X	
Van Ginderdeuren et al.	2019	X	X	X
Kohrt et al.	2018	X	X	X
Pace et al.	2018	X	X	
Spagnolo et al.	2018	X		
Egger et al.	2017	X		
Leonard and Masatu	2017		X	
Ndayisaba et al.	2017	X	X	
Kapoor et al.	2016	X		
Peter et al.	2016	X		
Gautham et al.	2015			X
Magge et al.	2015		X	
Nogaro et al.	2015	X		
Van Wieren et al.	2014	X	X	X
Amiri et al.	2013	X		
Bello et al.	2013		X	
Jawaid et al.	2013	X		
Rowe et al.	2012	X		X
Spector et al.	2012			X
Labhardt et al.	2010	X		
Palagyi et al.	2010	X		

Horwood et al.	2009		X		X
Kumar et al.	2009	X			
Rowe et al.	2009	X	X		X
Reynolds et al.	2008	X	X		
Stanbeck et al.	2007	X	X		X
Suh et al.	2007		X		
Couper et al.	2005	X			
Shah et al.	2003	X			
Mohit et al.	1999	X			
Zeitz et al.	1993	X	X		X
Total		27	18		15

THEME 1. EDUCATION AND TRAINING

Among the 27 studies that utilized education and training strategies, 12 were education and training interventions alone and 15 had multiple intervention strategies. Annex 3, Table 1 contains an overview of the studies.

Most provider competence interventions utilizing education and training strategies, measured provider knowledge as an outcome. Of the 27 studies, 18 studies measured provider knowledge and 13 measured provider practices as outcomes. Four studies; Bello et al., (2013), Kohrt et al., (2018), Stanbeck et al., (2012), and Zeitz et al., (1993) used both knowledge and practice measures. Among the 12 studies which had education and training interventions alone, all 12 used provider knowledge as an outcome measure. Only Kumar et al (2009) used both provider knowledge and practice measures. Across the range of outcomes, the education and training interventions had differential effects.

Among the 12 studies which utilized education and training interventions alone, the effects on provider/clinical knowledge were largely positive. There were significant improvements in provider/clinical knowledge after implementation of an education and/or training intervention. One study highlighted that the improvements in knowledge were retained months after implementing the intervention (Kapoor et al., 2016). Despite the long-term success of some education and training interventions, other studies highlighted that immediate completion of education and/or training interventions are expected to have an increase in provider/clinical knowledge, but these outcomes may not be indicative of sustainable achievements (Nogaro et al., 2015). For example, despite showing improvements in knowledge in the short term, technical knowledge decreased 6-12 months after the

education intervention was implemented (Amiri et al., 2013). Similarly, among the education and training interventions that measured impacts on provider skills, the effects were largely positive, but Amiri et al. (2013) found that provider skills declined 6-12 months after the intervention was implemented.

For the two studies that assessed provider/clinical competence, the results were mixed. Couper et al. (2005) found that delivery of short-term skills courses can improve competence, but they described how more guidelines, standards, and assessments need to be implemented to maintain positive outcomes. Palagyi et al. (2010) determined that despite showing competency for the curriculum's core clinical knowledge and skills during and at the conclusion of the 12-month training period, the clinical vignettes revealed poor competency at diagnosing and managing conditions six months after graduation. These two studies demonstrate that despite improvements, the education and training interventions alone were insufficient to ensure ongoing clinical competency. Figure 2 summarizes Egger et al (2017) as an example of a successful education and training intervention.

THEME 2. SUPERVISION AND MENTORING

Of the 18 studies that utilized supervision and mentoring, three were supervision and mentoring interventions alone and 15 had multiple intervention strategies. Annex 3, Table 2 provides an overview of the studies.

Most provider competence interventions utilizing supervision and mentoring strategies, used provider practice to measure outcomes. Of the 18 studies, 15 used provider practices as an outcome measured, while three used provider knowledge. Four studies used both provider practice and knowledge as outcome measures; Kohrt et al., (2018), Bello et al., (2013), Larson et al, (2019), and Zeitz et al., (1993). Looking among the four studies which had supervision and mentoring interventions alone, two assessed provider practice and two assessed both provider knowledge and practice. Across the range of outcomes, the supervision and mentoring interventions had differential effects.

Among the four studies which utilized supervision and mentoring interventions alone, the effects on protocol compliance/guideline adherence were positive. In the short term, adherence to case management guidelines increased after supervisory visits (Bello et al., 2013). In the long term (12 weeks), using an intervention in which health workers were told how they were expected to improve, encouraged to improve, and then received regular visits to measure quality, results show that clinicians react both to direct observation and to the scrutiny implied by having quality repeatedly measured (Leonard et al., 2017). Clinicians improved protocol adherence immediately when someone entered the room without any new training, equipment, or incentives (Leonard et al., 2017). To ensure that the immediate impact was not just attributable to the Hawthorne effect, a cohort of providers was evaluated at 18 months post intervention, finding sustained improvements in the quality of care (Leonard et al., 2017). Another intervention in which the know-do gap closes, was implementation of mentorship and a routine supportive supervision system (Magge et al., 2015). Although only one study by Bello et al. assessed

knowledge, supportive supervision improved knowledge scores among PHC workers. Figure 3 outlines Magge et al. (2014) as a successful example of a supervision and mentoring intervention.

THEME 3. PROTOCOLS AND TOOLS

Of the 15 studies that utilized protocols and tools, three were protocol- and tool-based interventions alone and 12 had multiple intervention strategies.

Among the 15 studies which implemented intervention strategies that utilized protocols and tools, the majority (11 total) used provider practices to measure outcomes, while five studies used provider knowledge. Two studies; Kohrt et al., (2018) and Stanback et al., (2007), used both provider knowledge and practices to measure the intervention's outcome. Looking among the three studies which implemented protocol- and tool-based interventions exclusively, all three used provider practice to measure outcomes. Despite all studies assessing the same outcome, the protocol- and tool-based interventions showed differential effects.

Among the four studies that included protocol- and tool-based interventions alone, the effects on protocol compliance/guideline adherence varied. In the short term, the interventions appeared to be successful in increasing protocol compliance/guideline adherence (Gautham et al., 2015; Spector et al., 2012). Two different studies which assessed outcomes at two months (Gautham et al., 2015) and six months (Spector et al., 2012) found improvements in protocol compliance via the CDSS tool used mobile media-rich interactive guidelines with audio, images, and video and a checklist-based childbirth safety program. Gautham et al (2015) is exemplified in Figure 4 as a successful protocol and tool-based intervention.

MULTI-COMPONENT INTERVENTIONS

Of the 37 included articles, 15 utilized multiple intervention strategies to improve the competence of health care workers, defined as multi-component interventions. These 15 articles utilized a range of interventions which combined education and training, supervision, and mentoring, and/or protocols and tools.

Numerous outcomes were assessed across multi-component intervention studies. Of the 15 studies, 12 measured provider practice and six measured provider knowledge. Three studies included both provider practices and knowledge as outcomes measures. Despite the wide range of outcomes assessed, most of the intervention effects were positive.

For the six studies that measured provider knowledge as an outcome, four indicated an improvement in provider/clinical knowledge. Critically, two studies indicated that these improvements were sustained 3-6 months after implementation (Pace et al., 2018) and 12 months after implementation (Labhardt et al., 2010). Despite the long-term success of these interventions, one study's intervention did not result in a meaningful improvement in provider knowledge (Larson et al., 2019). The failure in success was

attributed to a lack of sustained implementation (Larson et al., 2019). Furthermore, the quality of the healthcare system was a challenge to improving provider knowledge due to poor infrastructure of primary care clinics (Larson et al., 2019). Similar results were seen in the outcome for quality of care in the Larson et al. study. Even so, among the other studies which assessed quality of care, there were improvements after implementing multi-component interventions.

Other outcomes demonstrated some mixed success. Among the studies which assessed provider practices, five demonstrated improvements whereas two did not show improvements. In the study by Horwood et al. (2009), despite implementing IMCI, the fidelity to the guidelines were poor resulting in incomplete assessments and missed referrals. The other study by Van Ginderdeuren et al. (2019) showed that despite comprehensive training, post-training mentoring and feedback, there was poor adherence to IPT guidelines. Similar results were seen in the outcome for provider/clinical competence. Five of the studies demonstrated improvements, but two did not. One of the studies determined that there was no deterioration or improvement in provider competence over a 37-month period and explained this as a potential indicator of a need to revise the training program (Rowe et al., 2012). The lack of success for the second study was determined by a process evaluation which showed that there was a delay in implementation for some activities which resulted in an overall short implementation period (Getachew et al., 2021).

Although other outcomes had largely positive impacts, both studies which assessed provider skills demonstrated an improvement after implementing multi-component interventions. One of the studies found that these results were sustained three and six months after intervention completion, which suggests that with sustained clinical mentorship and support in developing health care delivery systems, health care workers can acquire the necessary knowledge to educate patients, effectively triage patients, and make appropriate referral decisions (Pace et al., 2018). Figure 5 outlines Stanback et al., (2007) which uses multiple interventions to support the implementation of clinical guidelines.

Discussion

This review included a total of 37 articles, of which three main approaches to improve provider competence in PHC settings were identified: 1) education and training, 2) supervision and mentoring, and 3) protocols and tools. Notably, close to a third of interventions identified as 'multicomponent', implementing more than one of the identified intervention strategies.

This review and previous reviews support that multi-component intervention provide positive outcomes in indicators for provider competence more frequently than single interventions (15-19). The results suggest that the characteristics of the interventions are a critical determinant of success, and that the success of an intervention must never be fully attributed to strategy alone. Examples of successful interventions characteristics include intensive dissemination of the interventions (i.e. regular training and mentoring, consistent monitoring and quality assurance, routine supervision, etc.). By implementing and maintaining intervention activities regularly and consistently, both single and multi-component interventions

demonstrated more positive indicators for provider competence. Some studies also indicated that integrating the interventions within the existing healthcare system framework increased the feasibility of the intervention and bridged implementation gaps to improve effectiveness. It is therefore critical that future provider competence interventions and studies have understanding of which factors are present that will influence success (i.e. provider supply, providers' ability to deliver care, etc.) to improve the probability of success and sustainability.

It is well understood that there is a “know-do gap” amongst health care providers in LMICs (21-15). Given the gap between what provider know and do in practice, it is critical that interventions success is determined using measures of provider practice. Both interventions utilizing supervision and mentoring, and protocol and tools were more likely to use outcomes measures that captured provider practices. Contrary, interventions utilizing education and training strategies were significantly more likely to measure success using provider knowledge as an outcome. The use of provider knowledge measures in education and training interventions is not surprising given the scope of these interventions – limiting the validity of the findings. Future interventions must include measures of provider practice such as clinical observations, clinical data, or fake patients, to improve the validity and application to clinical practice.

Despite decades of implementing interventions to improve provider competence in PHC settings in LMICs, there is largely insufficient evidence regarding which interventions are the most effective. There is a lack of comparative evidence across the three categories of interventions and between single and multi-component interventions. Two studies (Daud et al., 2020; Stanback et al., 2007) used randomized control trials which compared single and multi-component interventions. However, it is unclear on to what extent which interventions should rely on specific approaches or combination of approaches to maximize the effect on provider competence.

Other challenges include ambiguous approaches to intervention implementation. For example, there is currently little empirical agreement on the optimal amount and type of supervision as well as the timing of supervision to sustain improvements in provider competence (13). Although this critique has been brought up in previous reviews for interventions targeting supervision, this additionally can be reflected in other types of interventions as well, such as education and training interventions. Several of the studies included in this intervention assessing long-term outcomes showed improvements across the indicators of provider competence. However, many studies did not conduct long-term follow-up assessments – demonstrating a gap between the length of time interventions are expected to maintain positive outcomes without additional reinforcing mechanisms. This suggests a need to conduct and embed operational research in future provider competence studies to help identify optimal structures and models of delivery (13).

Although there are several challenges in determining which interventions (education and training, supervision and mentoring, and protocols and tools) are the most effective, the results of this scoping review highlight a few key trends which are reflected by previous reviews. This review and others have demonstrated the short-term benefits of implementing single component interventions, but there are

mixed long-term results (13,14). Despite the large success of many multi-component interventions, some results show that the intervention had no impact long-term. Some of the barriers to long-term improvements in provider competence include a failure to sustain high-level implementation of the intervention with fidelity and underlying weak healthcare infrastructure that acts as a barrier to improving provider competence. Even though these barriers apply to both single and multi-component interventions, it may be more difficult to implement multi-component interventions with a high level of fidelity.

The approach to this review had several strengths and limitations. The principal strength of this review was the comprehensive scope. Most previous reviews included interventions that occurred within high-income countries rather than LMICs, or focused on certain types of interventions to improve competence (i.e. supportive supervision alone) using restrictive definitions. In contrast, this review created a comprehensive search strategy to identify a range of interventions that have been implemented in LMICs. By doing so, this review aimed to provide comparative evidence across the three categories of interventions (education and training, supervision and mentoring, and protocols and tools) and between single and multi-component interventions.

The limitations of this review include that it was a scoping review and was limited to articles found within three databases. While these databases are required as the most comprehensive in the field, several studies may not have been captured in the search, though this was aimed to be ameliorated by conducting manual searches and screening references for included studies. In addition, the lack of the quality assessment of articles also limited the validity of this scoping review.

Conclusion

This scoping review conducts a comparative examination of a range of interventions to improve provider competence of HCWs in PHC settings in LMICs. Interventions to improve provider competence can be categorized into three themes: 1) education and training, 2) supervision and mentoring, and 3) protocols and tools. Multi-component interventions, intensive training of the interventions, regular and consistent implementation of the intervention, and integrating interventions within the existing healthcare infrastructure were key characteristics of successful interventions to improve provider competence. There is also a specific need to include measures of provider practice within provider competence intervention studies. However, despite the available evidence, there is still a lack of evidence on adapting, implementing, and sustaining interventions across contexts. With the growing recognition of the importance of provider competence and PHC, it is critical that policymakers and program implementers are informed by strong evidence as to which approaches are the most effective and sustainable at improving provider competence. Further research using comparative analysis trials are needed to examine which interventions are the most effective to improve provider competence.

Abbreviations

IMCI - Integrated Management of Childhood Illness

LMIC - Low-and-middle-income countries

MESH - Mentoring and Enhanced Supervision at Health centers

MOH - Ministry of Health

PHC - Primary Health Care

PHCPI - Primary Health Care Performance Initiative

Declarations

Competing interest:

The authors have no competing interests.

Availability of data and materials

All data generated or analyzed during this study are included in this published article [and its supplementary information files]. The datasets generated and/or analyzed during the current study are available at <https://docs.google.com/spreadsheets/d/1S4uIOPZsqfIVrcyY9-KFOdaQxhvlUMLsexmRF5bqSpw/edit?usp=sharing>

Funding

This research was supported, in whole or in part, by the Bill and Melinda Gates Foundation (Grant number INV000932), and it had no role in study design, data collection, data analysis, data interpretation or writing of the manuscript.

Author Contributions

This study was completed as a part of a summer internship for CS, who was the principal investigator for this work. CS completed the data collection, methodology selection, data analysis and drafting of the report. CF prepared the manuscript for publication, which included supplementary additional data analysis, contributions to the introduction, results, and discussion, and editing. MR and MVU contributed to conceptualization and methodology selection, along with extensive revisions of the manuscript.

Acknowledgments

The authors would like to acknowledge the larger World Bank team who provided extensive feedback on this study, including Jose Carlos Gutierrez, Caitlin Noonan, Latifat Okara, Oscar Bernal Acevedo, Federica

Authors Information

The authors: CS, CF, MR, MVU are part of the Primary Health Care Performance Initiative (PHCPI). PHCPI is a global partnership between the World Bank, World Health Organization, UNICEF, Global Fund, Results for Development, Ariadne Labs, and the Bill and Melinda Gates Foundation that is dedicated to improving the performance of primary health care systems globally through measurement.

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Figures

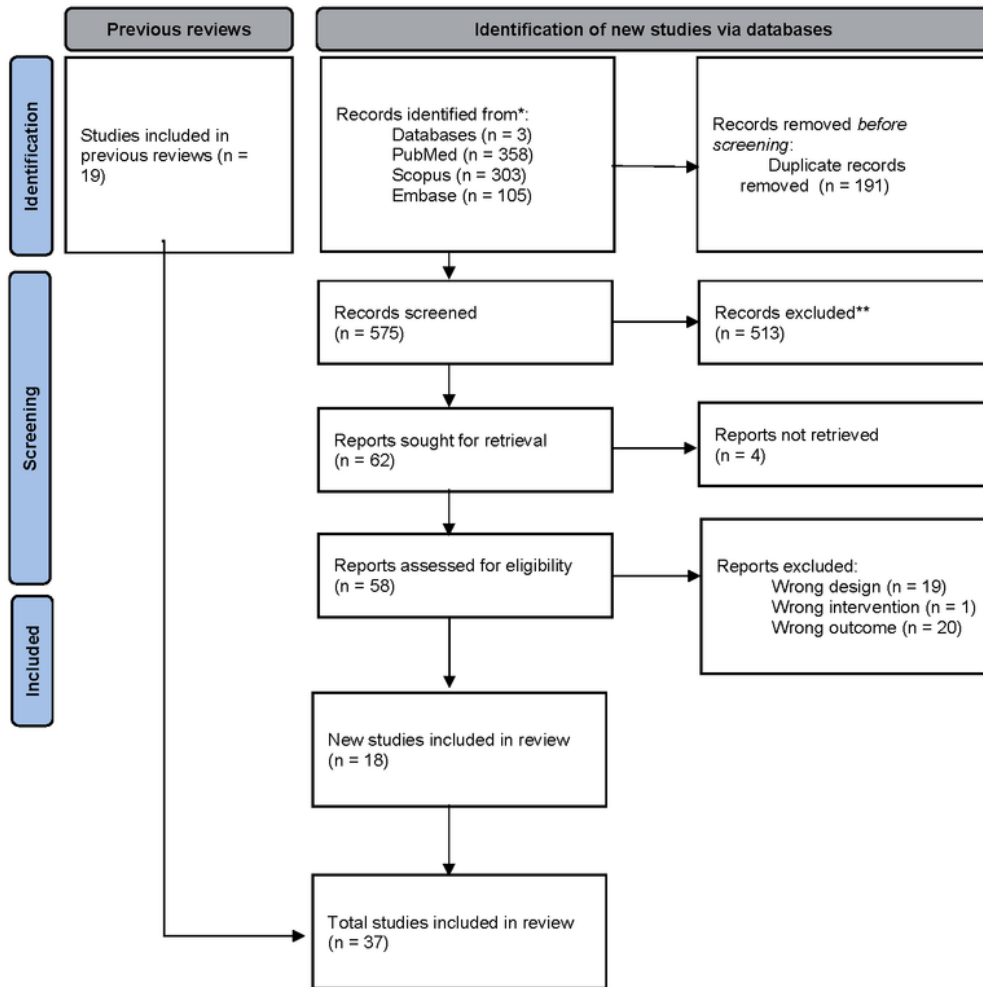


Figure 1

Evidence identification, screening, and inclusion process

Egger et al., (2017) implemented simple, low-cost interventions aimed at mid-level care providers, known as clinical officers in Kenya. Clinical Officers are non-physician health care providers who have completed three years of clinical training and a one year internship. Four interventions aimed at improving provider adherence to clinical quality guidelines were implemented for four common health conditions: urinary tract infection, vaginal discharge, tonsillitis, and childhood diarrhea. The interventions included online education modules, a continuing education session, monthly feedback meetings, and systemic environmental changes. Adherence was defined as “successfully performing all clinical quality measures (CQM)” and scored as “1” (successful) or “0” (not successful). The CQMs were developed using clinical practice guidelines from the World Health Organization (WHO) and Ministry of Health.

Adherence to the CQMs from the beginning of the study improved from 41.4 % to 77.1 %, although the results varied across the four health conditions assessed. After adjusting for health conditions, a logistic regression showed significant increases in CQM increases over the 6-month study period. Further analysis demonstrated that CQM adherence increased for the first two months of the study before leveling off. Supplementary interviews reported that the intervention was well received, and that providers had increased access to clinical mentorship, guidelines, and standards promoted by this intervention, which was noted as useful for improving performance.

Figure 2

Example of Successful Education and Training Interventions – Egger et al (2017)

The non-profit organization Partners in Health and the Rwanda Ministry of Health (MOH) collaborated to strengthen primary health care service delivery using a mentorship program to support to adoption of the Integrated management of Childhood Illness (IMCI) in remote and underserved districts in the country. IMCI is an algorithmic symptomatic approach to pediatric visits designed to improve case management, health systems support, and family and community practices. The intervention specifically adopted the Mentoring and Enhanced Supervision at Health centers (MESH) program. The MESH program, designed by Partners in health and the Rwanda MOH, builds on the foundation of IMCI training by supporting providers with a clinical mentor for support supervision, and facilitate quality improvement measures to address systems and gaps that affect IMCI implementation. The intervention was introduced to groups of four nurses at facilities; assigning one clinical mentor per district who was trained in IMCI, mentorship, and quality improvement who visited the health center every 4-6 weeks.

The intervention was assessed by health workers adherence to IMCI assessment, classification, counselling, and treatment guidelines using a set of standard IMCI indicators. Endpoint measures were taken one year after baseline. There were significant improvements in nearly all IMCI quality care indicators. The IMCI Integrated Assessment Index, which is a composite score of the 13 equally weighted assessment tasks (scored from 0 to 1), improved from .64 to .96 in district 1, and from .61 to .92 in district 2. The number of children correctly classified in both districts also increased from 56% to 91.5%. Treatment indicators also witnessed significant improvements, as children correctly treated increased from 78.3% to 98.2%. This study demonstrates the importance of supplementing formal training, in this case IMCI, with ongoing supervision and mentoring as a method for improving the competence of providers.

Figure 3

Example of Successful Supervision and Mentoring Interventions – Magge et al., (2014)

Gautham et al, (2014)., developed a mobile phone based, media-rich procedural guidance application to improve provider competence in Tamil Nadu, India. A randomized control experiment was conducted, assigning rural health providers to a control and intervention group. The intervention was a mobile phone based application, which integrated IMCI guidelines that were customized to the local context by a team of senior physicians and then converted into a media-rich algorithm which could be accessed on the providers mobile devices. The rural health care providers were evaluated twice, once after a two-day training and two months later. Provider competence measures were evaluated through direct observations, while the usability of phone and patient feedback were collected from structured questionnaires with open ended questions.

After the two day course, the control group had higher provider competence scores. However, after two months, the competence of the experimental exceeded the control groups. Moreover, the experimental group was more consistent in their competence (less variance) compared to the control group. In addition, 100% of health workers said they would use the system in future and would remember the protocols if they did not have access to the system, 87.5% said they would continue to use the system, recommend it to friends and colleagues, and found it useful to have a combination of audio, video, and picture clips in the system.

Figure 4

Example of Successful Protocols and Tools Interventions – Gautham (2014)

Stanback et al (2007) implemented a provider competence intervention designed to disseminate updated clinical guidelines. The intervention chosen was “intensive and multifaceted”, using a cascading training model in which providers attended workshops updated their co-workers upon returning to the clinics. In some groups, supportive supervision was used to reinforce the training. The training encouraged the adoption of new clinical guidelines related to family planning. Rural based facilitators led two day trainings across 41 districts. A total of 15 of the sites that attended the trainings were selected to receive additional supportive supervision, taking place every 1-3 months post intervention. The supportive supervision intervention enabled facilitating doctors to evaluate knowledge, skills, and provide feedback.

The intervention greatly increased the number of providers who saw (increase from 45 to 91 %) and read (increase from 29 to 74 %) at baseline compared to end line. Moreover, the proportion of providers giving correct responses on the quality indicators increased; and the magnitude of change increased in seven of the 10 indicators for those the cascade package. The magnitude of change increased across all 10 indicators amongst those who received both the cascade and supportive supervision intervention. The largest impact on quality indicators however occurred amongst those who physically attended the training sessions. Stand-alone interventions are impactful; however, the interventions effectiveness can be maximized when multifaceted.

Figure 5

Example of Successful Multi-Component Intervention – Stanback et al., (2007)

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