

BMJ Open Community health workers involvement in preventative care in primary healthcare: a systematic scoping review

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ABSTRACT

Objectives To review effective models of community health worker (CHW) involvement in preventive care for disadvantaged culturally and linguistically diverse (CALD) patients in primary healthcare (PHC) that may be applicable to the Australian context.

Design Systematic scoping review.

Data sources The studies were gathered through searching Medline, EMBASE, EMCARE, PsycINFO, CINAHL and online portals of relevant organisations.

Eligibility criteria All selected studies were original research studies which essentially evaluated preventive intervention undertaken by CHWs in PHC. The intervened population were adults with or without diagnosed chronic health disease, culturally and linguistically diverse, or vulnerable due to geographic, economic and/or cultural characteristics that impede or compromise their access to healthcare.

Data extraction and synthesis Data extraction was undertaken systematically in an excel spreadsheet while the findings were synthesised in a narrative manner. The quality appraisal of the selected studies was performed using effective public health practice project quality assessment tool.

Results A total of 1066 articles were identified during the initial search of six bibliographic databases. After screening the title, abstract and full text, 37 articles met the selection and methodological criteria and underwent data extraction. A high-quality evidence-base supporting the positive impact of CHWs supporting patients' access to healthcare and influencing positive behaviour change was found. Positive impacts of CHW interventions included improvements in clinical disease indicators, screening rates and behavioural change. Education-focused interventions were more effective in improving patient behaviour, whereas navigation interventions were most effective in improving access to services. Implementation was enhanced by cultural and linguistic congruence and specific training of CHWs in the intervention but reduced by short duration interventions, dropouts and poor adherence of patients.

Conclusion The evidence generated from this systematic scoping review demonstrates the contribution of CHWs to improving access to preventative care for patients from CALD and disadvantaged backgrounds by providing both education and navigational interventions. More research is needed on CHW training and the incorporation of CHWs into primary health care (PHC) teams.

Strengths and limitations of this study

- This systematic scoping review was conducted in accordance with the A Measurement Tool to Assess Systematic Review standards. Effective public health practice project quality assessment tool was used for quality assessment of the identified studies.
- Six bibliographic databases were searched using a basic search strategy that were modified as per the database requirements.
- Reliability of the study selection, data extraction and rating of the study quality was ensured by four reviewers.
- The studies were heterogeneous in their methods and outcomes evaluated.

INTRODUCTION

The burden of disease due to chronic conditions is increasing in Australia and globally.¹ Primary healthcare (PHC) has an important role in the prevention and management of these conditions.² Often this requires the management of behavioural and physiological risk factors that are within the scope of PHC practice.³ However, there are concerns about the capacity of PHC providers to deal with this additional workload.⁴ This has given rise to calls for greater sharing of responsibility within the PHC team and extending the team to include new categories of workers.⁵

The burden of chronic disease is not shared equally among the population. Those in the lowest fifth of the Australian population by socioeconomic position have worse prevalence and mortality rates for most long-term conditions than those with a higher socioeconomic status.⁶ However, there are structural and systematic barriers to access preventative care for low socioeconomic groups and certain ethnic groups such as cost, poor integration of care between providers and services and insufficient access to interpreters or bilingual workers.^{7–9} They may also have



low health literacy which in turn is associated poorer uptake of preventive care and preventive behaviours.^{10–13} Reducing barriers to preventive care in PHC is necessary in order to reduce healthcare disparities, mortality, morbidity, hospitalisation rates and healthcare cost.^{14 15}

Community health workers (CHWs) are members of a community whose role focuses on providing individual patients support. CHWs have the potential to improve access to preventive care and contribute to reduced hospitalisation and rehospitalisation rates among disadvantaged populations.

With this review we sought to identify effective models of CHW involvement in preventive care in PHC, especially for culturally and linguistically diverse (CALD) patients.

Research question

The objective of this review was to assess the effectiveness of models of CHW involvement in preventive care for disadvantaged patients in PHC that could be applicable to Australian context. We also sought to describe the implementation of these models and understand the context of CHW interventions, in addition to their effectiveness in improving health and health service outcomes.

CHWs are frontline health workers who have numerous job titles including CHWs; lay health workers; health promoters; health navigators. The definitions of CHWs are equally varied. For this study, we chose the definition developed by the American Public Health Association: ‘community health workers (CHWs) are frontline public health workers who are trusted members of and/or have an unusually close understanding of the community served. This trusting relationship enables CHWs to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery. CHWs also build individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counselling, social support and advocacy’.¹⁶

Disease prevention, includes specific, population-based and individual-based interventions for primary and secondary (early detection) prevention, which aim to minimise the burden of disease and associated risk factors.¹⁷

METHODS

Our review was guided by the standard principles of systematic scoping review,^{18–20} and the protocol for the review was published in the website of Centre for Primary Health Care and Equity, UNSW Sydney (<https://cphce.unsw.edu.au/research/health-system-integration-and-primary-health-care-development/community-health-workers>). It has been recognised that social problems and public health interventions are complex. Therefore, a wide variety of study designs may be used in the evaluation of public health interventions ranging from

Table 1 Database and the search results

Database	Date of search	No of results
Medline	29/07/2019	485
Psych Info	29/07/2019	19
Embase classic + Embase	29/07/2019	359
Emcare	29/07/2019	94
MEDLINE Epub ahead of print and in-process and other non-indexed citations	29/07/2019	26
CINAHL	29/07/2019	83
Total		1066

randomised controlled trials (RCTs) to case studies, with no single method being able to answer all relevant questions about the effectiveness of all public health interventions.²¹ This study drew on a realist approach to evaluate complex interventions.^{22 23} We used an approach to data synthesis which focused on understanding the mechanisms by which an intervention works or not,²⁴ the context in which interventions are implemented and the different levels at which they operate.

Data sources

We searched Medline, Medline Epub ahead of print and in-process and other non-indexed citations, PsychINFO, EMBASE Classic+EMBASE, EMCARE and CINAHL from the period of 1 January 2000 to 29 July 2019. The databases searched and results are presented in [table 1](#). We used search terms ([table 2](#)) for each database to guide our search. We supplemented our search of the peer-reviewed literature with a grey literature search. We searched topic-specific organisations online portals including the CDC Community Guide, American Public Health Association, Commonwealth Fund, Robertwood Johnson Foundation, WHO Europe, WHO USA, National Institute of Health and Care Excellence, UK, Cochrane and Campbell, NZ Ministry of Health and Aboriginal Health Info Net.

The inclusion criteria for the study are listed in [box 1](#). Included studies needed to evaluate a preventive intervention that mobilised CHWs/lay health workers and was delivered in any PHC setting with disadvantaged population groups. Studies that were based in hospitals were excluded. The intervention population included adults with or without chronic health conditions. Disadvantaged population characteristics were identified based on geographical remoteness and access to PHC, socioeconomic condition, cultural and linguistic background, and Indigenous heritage.

The healthcare interventions are quite different in different health systems. We focused in countries with developed health systems where the CHW role supplements rather than replaces traditional roles of doctors, nurses and other health professionals. Therefore, we selected studies that were conducted in Organisation

Table 2 Basic search strategy used for the review

S no	Key terminology
1	Community health worker.mp. or exp Community Health Workers/ 49094909
2	Lay Health worker.mp.
3	Health Promoter.mp.
4	Community worker.mp.
5	Health Services, Indigenous/ or aboriginal health worker.mp.
6	Health Volunteer.mp.
7	Community Health Workers/ or Community Health Volunteer.mp.
8	Health Navigator.mp. or Patient Navigation/
9	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8
10	prevention.mp. or 'CENTERS FOR DISEASE CONTROL AND PREVENTION (U.S.)'/ or SMOKING PREVENTION/ or exp SECONDARY PREVENTION/ or exp PRIMARY PREVENTION/
11	Primary prevention.mp. or Primary Prevention/
12	Preventive medicine.mp. or Preventive Medicine/
13	Preventive care.mp. or Preventive Medicine/
14	Disease Prevention.mp.
15	Preventive healthcare.mp.
16	10 or 11 or 12 or 13 or 14 or 15
17	Primary health care.mp. or exp Primary Health Care/
18	Primary healthcare services.mp.
19	Community health care.mp. or Community Health Services/
20	General Practice.mp. or Family Practice/ or General Practice/
21	Family Practice/ or Primary Health Care/ or family medicine.mp.
22	17 or 18 or 19 or 20 or 21
23	9 and 16 and 22
24	limit 23 to (yr="2000 -Current" and english)

for Economic Cooperation and Development (OECD) countries.

Study assessment process

Initial titles and abstracts were screened by NS and SKM to determine the eligibility of the studies. The remaining studies required full text review, which was conducted equally by MH, EH and JL. The final inclusion was

determined through joint discussions and review among the authors.

Data extraction

Data extraction was conducted using excel spreadsheet under predefined variables: citation, context (country, service), study setting, focus of the study, study design, type of participants, sampling, sample characteristics, response rate/drop outs, control or comparison group, number of participants, type of CHW/role, CHW characteristics (age, sex, ethnicity, condition), CHW recruitment and training, intervention type, intervention duration/frequency/mode of conduct, evaluation (impacts on health services, quality of care, patient behaviours, risk factors, patient health service use, screening, disease incidence, mortality, quality of life), economic evaluation, barriers and enablers mechanism, authorising environment.

Participants

This study focused on socioeconomically disadvantaged population groups. Thus, the study population included: those with limited access to material and social resources

Box 1 Inclusion criteria for studies

1. Community health workers.
2. Years: 2000 to current (29 July 2019).
3. English language.
4. OECD countries.
5. Related to intervention/ control/ comparison.
6. Primary healthcare setting.
7. Excluded hospital settings.
8. Exclusion based on CALD communities and disadvantaged population was carried out at the later stage of review process.

CALD, culturally and linguistically diverse; OECD, Organisation for Economic Cooperation and Development.



because of social and economic factors; CALD population (with diverse language, ethnic background, nationality, dress, tradition, food, societal structures, art and religious characteristics)²⁵; people in rural settings, whose ability to access PHC is limited by their rural or remote geographical location; and Indigenous or Aboriginal people.

Quality appraisal

We assessed the quality of included systematic reviews using A Measurement Tool to Assess Systematic Review (AMSTAR). AMSTAR is comprehensive quality appraisal instrument that enables detailed assessment of systematic reviews process that include randomised or non-randomised studies of healthcare interventions or both.²⁶ For the quality assessment of our included studies, we used the effective public health practice project quality assessment tool in order to assess the methodological quality and the relevance of the study.²⁷ Studies were evaluated across eight categories (selection bias, study design, confounders, blinding, data collection methods, withdrawals and drops, intervention integrity, analyses) with each given a score of 1 to 3 (1=strong, 2=moderate and 3=weak).

Analysis

The analysis was guided by the research question which focused on understanding models of CHWs involvement in preventive care. Because of the heterogeneity of the included studies in terms of their research design, meta-analysis was impeded. We conducted descriptive analysis of studies, interventions, roles and training of CHWs. The analysis of impacts and outcomes was conducted taking into consideration the intervention type and the quality of studies. The information on barriers and enablers was extracted from the Discussion section of the original articles. The barriers and enablers were qualitatively analysed considering the intervention type and the quality of studies.

RESULTS

A total of 1066 articles were identified during the initial search. After excluding 283 duplicates, 783 articles were screened, and a further 673 articles were excluded after title and abstract screening. Due to the diverse role of CHWs, it was difficult to assess the eligibility of articles from title and abstract search, 110 underwent an initial full text review, resulting in 53 exclusions. We excluded 20 more articles at the time of extraction because they were not focused on primary or secondary prevention, did not evaluate an intervention, were hospital based, were a systematic review not focused on CHWs, or were not in OECD countries. Thirty-seven articles were included and underwent data extraction (figure 1). The characteristics of the included studies are summarised in tables 3 and 4. Of the total 37 studies whose quality were assessed, 16 studies were categorised as moderate and 21 studies were categorised as weak (see table 5 and online

supplementary file 1). Articles were not excluded due to a low-quality rating but the quality appraisal was considered for analysing effectiveness.

Study designs

Studies were selected irrespective of their study design. Of the total 37 included studies, 18 were RCTs,^{28–45} four had one group pre-test post-test design,^{46–49} 13 were non-randomised trials^{33 50–61} and two studies were qualitative.^{40 62}

Country

The majority of the studies were carried out in the USA. One study in Mexico, one in the US and Mexico, one in Belgium and one in New Zealand.

Study settings

All the studies were executed in PHC and community settings. PHC settings included primary health clinics, community health centres, medical centres and cancer screening centres. Participants were recruited from various community settings such as community organisations, community resource centres, senior centres, social service centres and rural community centres.

Types of participants

Consistent with our selection criteria, all the studies were carried out among disadvantaged population groups. Studies conducted in the USA were among Hispanic or Latinos, African-American and Native American communities. The study from New Zealand was conducted among the Maori community members whereas in Belgium the study was conducted among older women living in semi-rural parts of the country. The study population were marginalised in societies that lead to disparities in their health and their healthcare access. The study populations' disadvantaged status was based on: ethnic status, minority status, migration status, low income, poor healthcare access, lack of health insurance and high prevalence of disease on the population.

Types of diseases

Preventive interventions focused on both chronic and non-chronic conditions. Seventeen studies sought to enhance preventive care for three different types of cancer. Of those 17, 8 were on colorectal cancer,^{30 31 34 36 37 57 61 63} 2 were on cervical cancer^{56 59} and 4 were on breast cancer.^{32 33 41 45} In the remaining three studies, cancer prevention was the focus in all three.^{40 42 54} There were seven studies on diabetes prevention,^{35 39 43 49 52 58 59} and five on cardiovascular disease prevention.^{29 46–48 62} Three focused on managing hypertension,²⁸ depression³⁸ and smoking.⁴⁴ Others were aimed at reducing infant mortality,⁵⁰ screening for lead poisoning,⁵³ preventing sexually transmitted diseases (STDs)⁶⁴ and human papillomavirus⁵⁵ infection. There was only one study that carried out an intervention to prevent multimorbid conditions.⁵¹

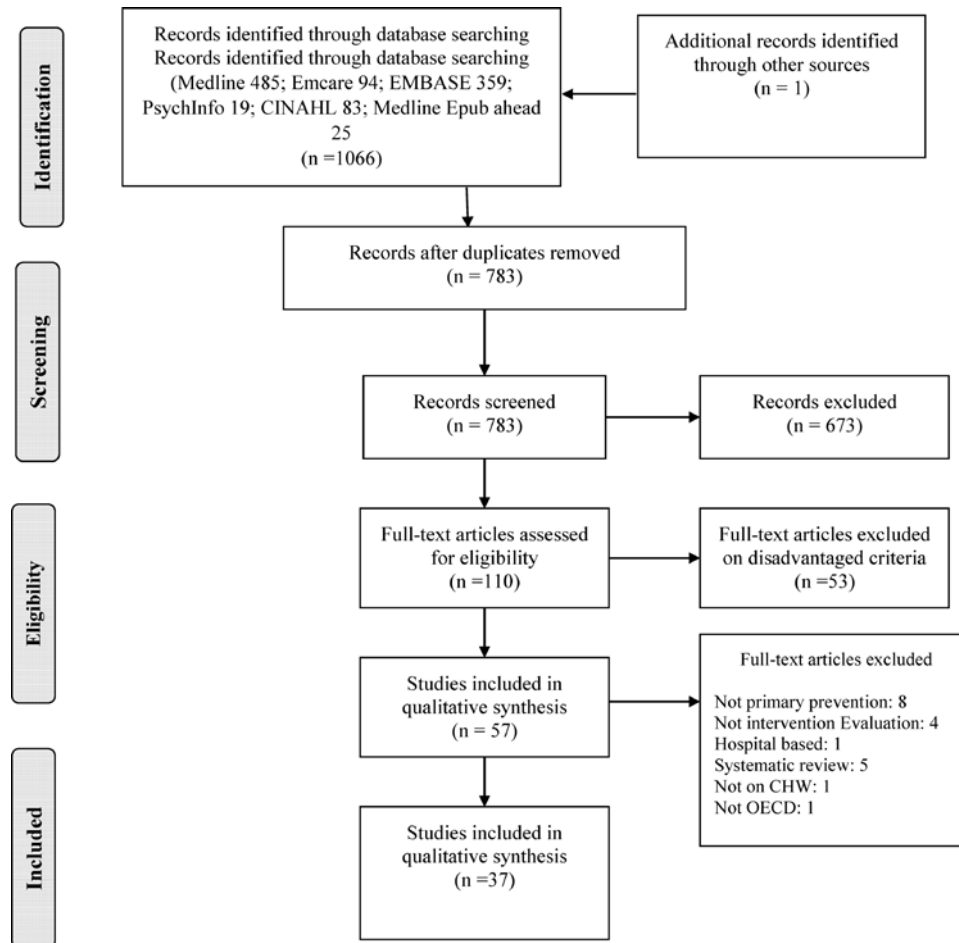


Figure 1 PRISMA flowchart. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Types of interventions and roles of CHWs

The interventions durations varied, lasting from 90 mins to 2 years. Four different types of interventions were identified based on the strategies used to deploy CHWs for the preventive measures (see online supplementary file 2). They were:

1. Education interventions.^{28 29 38–40 46 47 49 53 55 60 62}
2. Navigation interventions.^{30 32 33 35 37 42 45 61 63}
3. Education + navigation interventions.^{31 34 36 41 54 56 57}
4. Education + self-management interventions.^{43 44 48 50–52 58 59 64}

Education interventions were based on the principle of preventing disease through education and awareness of social and clinical risk factors enabling positive change in health behaviour. Education sessions were provided to participants either in group or in person or in combination of group session and individual coaching. The education materials used were either curriculums that were developed as a part of an intervention itself or used from an already developed educational module. The education materials were often culturally tailored, translated and delivered in participant's community language.

The navigation interventions focused on reducing barriers to healthcare access. Eight out of nine studies that used navigation interventions in this review were carried

out to identify and reduce barrier to cancer screening among participating communities.

Education plus navigation interventions were more holistic in their approach compared with interventions that focused on either strategy alone. Where both were provided, along with education, the participants were assisted to identify and overcome barriers to healthcare access. This type of intervention was carried out predominantly for cancer prevention.

Education plus behavioural or self-management interventions were the second most frequently reported interventions after the education interventions. Apart from providing education on disease risk factors, this type of interventions focused on enabling participants to choose healthy lifestyle options and change their behaviour accordingly. The CHWs provided emotional as well as practical support along with education to enable behaviour change among study participants through self-management techniques.

Types of CHWs

CHWs were described using a range of terms such as: promotores de salud/ promotora,^{28 29 39 40 46–49 51 52 55 58 59} health advocate/lay helper,²⁹ patient navigator/ health navigator/navigator/ peer-patient navigator/health

Table 3 Characteristics of included studies

Study	Title	Country	Study setting (eg, PHC)	Study design	Type of participants /subject/ study population
Balcázar <i>et al</i> , 2011 ⁴⁷	Salud para su corazón (health for your heart) community health worker model: community and clinical approaches for addressing cardiovascular disease risk reduction in hispanics/latinos	US-Mexico border	Community and clinical based	Two groups pre-post test	Hispanic communities
Balcázar <i>et al</i> , 2012 ⁴⁸	An ecological model using promotores de salud to prevent cardiovascular disease on the US-Mexico border: the HEART project	US-Mexico border, Texas	Community-based participatory research, HEART project, ecological approach	Cohort type pre-post design	Hispanic adults aged 18 years or older who resided in the 2 selected zip codes, were not planning to move from the area in the next 10 months, and were able to participate in the physical activities of MICMIC were eligible
Balcázar <i>et al</i> , 2009 ⁴⁸	A randomized community intervention to improve hypertension control among Mexican Americans: using the promotoras de salud community outreach model	US-Mexico border: Texas	Community-based participatory research	Randomised community intervention	Hispanic communities
Balcázar <i>et al</i> , 2010 ²⁹	A promotores de salud intervention to reduce cardiovascular disease risk in a high-risk Hispanic border population, 2005–2008	US-Mexico border, Texas	Community-based participatory research	Randomised community trial	Hispanic community
Barnes-Boyd <i>et al</i> , 2001 ⁵⁰	Promoting infant health through home visiting by a nurse-managed community worker team	Chicago, USA	Community and clinical based	Non-randomised	African-American women/mothers to be
Braschi <i>et al</i> , 2014 ³⁰		New York, USA	Primary care centre	Randomised clinical trial	Vulnerable population: Latino Americans
Cruz <i>et al</i> , 2013 ⁴⁹	The effectiveness of a community health program in improving diabetes knowledge in the Hispanic population: Salud y Bienestar (Health and Wellness)	California, Texas, Washington DC, USA	Community setting	Quasi experimental, one group pre-test and post-test design	Hispanic population
DeGroff <i>et al</i> , 2017 ³¹	Patient navigation for colonoscopy completion: results of an RCT	Boston, USA	Medical centre	Randomised control trial	Low-income, adults, primarily Hispanic and non-Hispanic blacks
Denman <i>et al</i> , 2014 ⁵²	Evaluation of the community-based chronic disease prevention program Meta Salud in Northern Mexico, 2011–2012	Sonora, Mexico	Community health centre	Non-randomised, quasi experimental, pre-test, post-test study	Low-income resident of urban area. Majority with Mexican heritage
Goelen <i>et al</i> , 2010 ³²	A community peer-volunteer telephone reminder call to increase breast cancer-screening attendance	Belgium	Semirural community	Individual level randomised trial	Female, 50–59 years old, living in semi-rural part of Belgium, who had not attended the screening
Hoffman <i>et al</i> , 2012 ³³	Patient navigation significantly reduces delays in breast cancer diagnosis in the District of Columbia	District of Columbia, USA	Women were examined from 2006 to 2009 at 9 hospitals/clinics at DC	Randomised, network navigation	Low-income Women, mainly Latinas, African-Americans

Continued

Table 3 Continued

Study	Title	Country	Study setting (eg, PHC)	Study design	Type of participants /subject/ study population
Honeycutt <i>et al</i> , 2013 ⁶³	Evaluation of a patient navigation program to promote colorectal cancer screening in rural Georgia, USA	Rural Georgia, USA	13 Community health centre, of which 4 clinics had community cancer screening programme available comprise the intervention group	Quasi experimental/ programme or performance evaluation between intervention and comparison community health clinics	Uninsured and underinsured low-income population
Horne <i>et al</i> , 2015 ³⁴	Effect of patient navigation on colorectal cancer screening in a community-based randomized controlled trial of urban African American adults	Baltimore city, USA	Clinical settings and community-based avenues such as senior centres in urban areas	Community-based randomised control trial	Older African-American adults, aged 65 and older
Hunter <i>et al</i> , 2004 ³⁵	The impact of a promotora on increasing routine chronic disease prevention among women aged 40 and older at the U.S.-Mexico border	Sonora, Mexico and Arizona, USA	Participants were randomly selected from the communities	Randomised controlled interventions	Uninsured Hispanic women aged 40 years and older
Jandorf <i>et al</i> , 2013 ³⁶	Culturally targeted patient navigation for increasing African Americans' adherence to screening colonoscopy: a randomized clinical trial	USA	Primary care clinic	Randomised clinical trial	African-American, aged 50 years and above
Jandorf <i>et al</i> , 2013 ³⁷	Implementation of culturally targeted patient navigation system for screening colonoscopy in a direct referral system	NY, USA	Urban primary care clinic	Randomised into peer-patient navigation (PN) group and pro-PN group.	African-American patients
Kegler and Malcoe, 2004 ⁵³	Results from a lay health advisor intervention to prevent lead poisoning among rural Native American children	Ottawa County, Oklahoma, USA	Community based	Intervention focus on entire native community	Entire native community members
Kieffer <i>et al</i> , 2013 ³⁸	Effect of the healthy mothers on the move (MOMs) lifestyle intervention on reducing depressive symptoms among pregnant Latinas	Southwest Detroit	Healthy MOMs was conducted in several community partner organisation settings	Community-based randomised control trial	A pregnant Latina was eligible to participate in this study
Koniak-Griffin <i>et al</i> 2015 ³⁹	A community health worker-led lifestyle ehealth intervention for Latina (Hispanic) women: feasibility and outcomes of a randomized controlled trial	LA, USA	Community based	Randomised controlled trial	Self-identified Latinas, 35–64 years of age, Spanish and/or English speaking and over weight (BMI≥25)
Krantz <i>et al</i> , 2017 ⁶²	Reduction in cardiovascular risk among Latino participants in a community-based intervention linked with clinical care	Denver, USA	Primary care setting	Convenience sampling, before and after design	Self-identified Latinos, 45 years and above
Larkey <i>et al</i> , 2017 ⁴⁰	A cancer screening intervention for underserved Latina women by lay educators	Phoenix, Arizona	Community based	Group randomised trial	Underserved Latinas, self-identifying as Hispanic/Latina
Marshall <i>et al</i> , 2016 ⁴¹	Effect of patient navigation on breast cancer screening among African American Medicare beneficiaries: a randomized controlled trial	Baltimore city, USA	Community based and clinical setting	Randomised control trial	African-American older adult women

Continued

Table 3 Continued

Study	Title	Country	Study setting (eg, PHC)	Study design	Type of participants /subject/ study population
Mojica <i>et al</i> , 2016 ⁵⁴	Breast, cervical, and colorectal cancer education and navigation: results of a community health worker intervention	San Antonio, Texas, USA	Community based	A single-arm, non-randomised, pre-post design	Eligible participants were Latino women (1) aged 40–74 years who had never had a mammogram or not had one in the last 2 years, (2) aged 18–65 years who had never had a Pap test or not had one in the last 3 years or (3) aged 50–75 years who had never had a stool blood test or not had one in the last 2 years
Molina <i>et al</i> , 2018 ⁴⁵	Patient navigation improves subsequent breast cancer screening after a noncancerous result: evidence from the patient navigation in medically underserved areas study	Chicago, Illinois, USA	Clinical setting	Randomised controlled trial	Women aged 50–74 years residing in medically underserved areas
Parra-Medina <i>et al</i> , 2015 ⁵⁵	Promotora outreach, education and navigation support for HPV vaccination to Hispanic women with unvaccinated daughters	South Texas, USA	Participants were selected from community events, health fairs and also approached women one-on-one within their community resource centres and surrounding colonies	Community based: non-randomised	Women of self-reported Hispanic ethnicity with a daughter, aged 11–17 years, who has not received the HPV vaccine and reside in Cameroon or Hidalgo counties
Percac-Lima <i>et al</i> , 2016 ⁴²	Patient navigation for comprehensive cancer screening in high-risk patients using a population-based health information technology system: a randomized clinical trial	Massachusetts, USA	Primary care practices	Randomised clinical trial	Low-income and racial/ethnic minority populations
Percac-Lima <i>et al</i> , 2013 ⁵⁶	The impact of a culturally tailored patient navigator program on cervical cancer prevention in Latina women	Chelsea, Massachusetts, USA	The study was conducted at the MGH (Massachusetts General Hospital) Colposcopy Clinic and the MGH Chelsea HealthCare Centre (MGH Chelsea), an urban community health centre in Massachusetts	Non-randomised	Women were eligible for the study if they self-identified as Latina, had an abnormal Pap smear requiring colposcopy evaluation between 1 January 2004 and 15 April 2011

Continued

Table 3 Continued

Study	Title	Country	Study setting (eg, PHC)	Study design	Type of participants /subject/ study population
Percac-Lima <i>et al</i> , 2014 ⁵⁷	The longitudinal impact of patient navigation on equity in colorectal cancer screening in a large primary care network	USA	Community health centre	Colorectal cancer (CRC) screening rate was compared between community health centre with patient navigation and CHC without patient navigation	Low-income, predominantly Latinos and immigrants
Simmons <i>et al</i> , 2008 ⁶³	Development and piloting of a community health worker-based intervention for the prevention of diabetes among New Zealand Maori in Te Wai o Rona: diabetes prevention strategy	New Zealand	Community based	Randomised cluster-control trial, sample were clustered according to small census area	Non-pregnant Maori community members, Those unfit to sign a consent form, with terminal disease or not permanently residing in the study area at the time of the baseline data collection were excluded
Staten <i>et al</i> , 2012 ⁵⁸	Effectiveness of the Pasos Adelante chronic disease prevention and control program in a US-Mexico border community, 2005–2008	USA: US-Mexico border	Community based	Non-randomised	Participants were primarily Hispanic women who were born in Mexico, preferred speaking Spanish, were married and were not educated beyond high school
Treadwell <i>et al</i> , 2010 ⁵⁹	Addressing obesity and diabetes among African American men: examination of a community-based model of prevention	Lorain County, Ohio, USA	Community based	Non-randomised	African-American men
Wagoner <i>et al</i> , 2015 ⁶⁴	Latino men's qualitative perspectives on a lay health advisor (LHA) intervention to promote their sexual health	North Carolina, USA	Community-based participatory research	Qualitative study to understand the effectiveness of LHA intervention designed to reduce the risk of HIV infection	Latino men who served as LHAs and their social networks in North Carolina, USA
Wells <i>et al</i> , 2012 ⁶⁰	Creating a patient navigation model to address cervical cancer disparities in a rural Hispanic farmworker community	Florida, USA	Rural community setting	Non-randomised	Hispanic farmworkers
Wilson <i>et al</i> , 2015 ⁶¹	Cost-effectiveness analysis of a colonoscopy screening navigator program designed for Hispanic men	Texas, USA	Community setting	Non-randomised	Hispanic males 50 and older who were members of Care Link (Bexar County's financial assistance programme) and who had not received colorectal cancer (CRC) screening in the last 10 years
Woodruff <i>et al</i> , 2010 ⁶⁴	Recruitment, training outcomes, retention, and performance of community health advisors in two tobacco control interventions for Latinos	San Diego	Community setting	Randomised trials	Latino community

Continued



Table 3 Continued

Study	Title	Country	Study setting (eg, PHC)	Study design	Type of participants /subject/ study population
PHC, primary health care.					

coordinator,^{30 33 34 36 37 41 42 45 56 57 60 63} lay health advisor/
lay navigator/lay health assistant,^{31 53 64} peer volunteer,³²
women health advocates,³⁸ CHWs^{35 43 54 61 62} and commu-
nity health advisor.⁴⁴

CHWs were mostly females (only in few instances CHWs were male) and were members of the communities they served. They were bilingual individuals who spoke English together with their community language. They had previous experience working in community sectors or as CHWs.

Thirty-two out of 37 included studies provided some form of training to CHWs before deploying them in preventive interventions. Training was provided to help the CHWs to gain competencies in activities that were directly related to their roles. Thus, the training provided to CHW differed from programme to programme. CHWs training programmes were variable in content and duration of the trainings. The duration of trainings varied lasting from 4 hours to courses that lasted for 6 months. For education-related interventions, CHW's training was structured around curriculums or educational modules that were being delivered as a part of interventions. For navigation-related interventions, training were structured around operational or implementation aspects. CHWs training identified in the review included, but were not limited to the following topics:

1. Your heart, your life curriculum.^{28 29 46 47}
2. Basic skills of reducing and preventing cardiovascular disease (CVD) in Hispanic communities. Training on capacity-building strategies, tools for identifying community resources, advocacy, food handling techniques, preintervention postintervention data collection techniques.⁴⁸
3. Didactic training on general health advocacy, maternity-child health issues, field experience with health aids in local health departments.⁵⁰
4. Training on chronic disease management and on application of the 'Transformation of health conceptual framework' to facilitate behaviour change among participants.⁵¹
5. Review of diabetes disease, how to use study questionnaire and study materials on diabetes education, nutrition and physical exercise, role of health promoters for community health promotion.⁴⁹
6. Training on motivational interviewing.³¹
7. Cancer screening techniques, study design and operational aspects such as handling telephone reminder call system and study registration.^{32 37}

The training sessions were administered through a wide variety of individuals and institutions. Some training was administered by a lead programme coordinator or programme staff. Other training was provided by a lead CHWs who had previous experience delivering same or similar types of interventions to the community. On some occasions, CHWs were provided with training by health-care providers. Some of the programmes required CHWs to obtain CHW certification from registered educational institutions.

Table 4 Impacts/outcomes analysis for the included studies

Impacts/outcomes				
Study	Evaluation: impact on patient behaviours, risk factors	Evaluation: impact on patient health service use, screening	Evaluation: impact on disease incidence, mortality, quality of life	Economic evaluation
Balcázar <i>et al</i> , 2009 ⁴⁶	Changes in heart-healthy behaviour	N/A	The positive changes further observed in some clinical outcomes (eg, low density lipoprotein (LDL) cholesterol level, triglyceride level, waist circumference, diastolic blood pressure, weight and glycosylated haemoglobin (HbA1c))	N/A
Balcázar <i>et al</i> , 2011 ⁴⁷	N/A	N/A	N/A	N/A
Balcázar <i>et al</i> , 2012 ⁴⁸	Improved self-reported attitudes and perceptions towards cardiovascular disease (CVD) risk reduction, improved self-reported dietary behaviours and improved clinical outcomes such as total cholesterol, non-high density lipoprotein cholesterol and low density lipoprotein cholesterol among others	N/A	N/A	N/A
Balcázar <i>et al</i> , 2009 ²⁸	Positive change in blood pressure reduction but not significantly. Changes in dietary/food habits associated with control blood pressure	N/A	Positive change in blood pressure reduction	N/A
Balcázar <i>et al</i> , 2010 ²⁹	Changes were seen in risk factors for cardiovascular disease (CVD) on study population observed in terms of decreased in weight, low-density lipoprotein cholesterol, and total cholesterol, and non-high density lipoprotein cholesterol, systolic and diastolic pressure for the control group	N/A	N/A	N/A
Barnes-Boyd <i>et al</i> , 2001 ⁵⁰	N/A	N/A	Positive results were observed in terms of infant's health outcomes. Low incidence of infant deaths suggested that the program had a positive impact on postneonatal mortality when compared with prevailing citywide and community rates. Immunisation rate was higher compared with the previous programme and to local and national statistics	N/A

Continued

Table 4 Continued

Impacts/outcomes		Evaluation: impact on patient behaviours, risk factors	Evaluation: impact on patient health service use, screening	Evaluation: impact on disease incidence, mortality, quality of life	Economic evaluation
Braschi <i>et al</i> , 2014 ³⁰	N/A		Increased screening colonoscopy completion by ~30% above the recent estimation for physicians-referred patients	N/A	N/A
Christina Esperat <i>et al</i> , 2012 ⁵¹	Significant improvements in the targeted clinical indicators (systolic and diastolic blood pressure; Haemoglobin, level of lipid panels such as cholesterol, triglycerides, HDL, LDL, and emergency hospitalisation and emergency visits) that were tracked at baseline, at 6 months, and at the end of 12 months of intervention. Patient's behaviour change were evaluated through t-test. There were several behavioural improvements identified through the navigation programme. Self-efficacy of chronic disease management were improved. Diabetes self-activities were significantly improves, patients were following healthful diet plans, doing more exercise and monitoring blood sugar regularly	N/A	N/A	N/A	Programme was too short to make a conclusion on economic evaluation of the programme
Cruz <i>et al</i> , 2013 ⁴⁹	Among diabetic participants, a significant improvement was observed on diabetes knowledge when comparing pre-test and post-test scores (13.7 vs 18.6, p=0.001; Cohen's d=1.2). Among non-diabetic participants, diabetes knowledge also increased significantly after one-single training session (12.9 vs 18.2, p=0.001; Cohen's d=1.2).	N/A	N/A	N/A	N/A
DeGroff <i>et al</i> , 2017 ³¹	N/A	Navigation significantly improved colonoscopy screening completion among a racially diverse, low-income population. Colonoscopy completion was significantly higher for navigated patients (61.1%) than control group patients receiving usual care (53.2%, p=0.021)	N/A	N/A	N/A

Continued

Table 4 Continued

Impacts/outcomes		Evaluation: impact on patient behaviours, risk factors	Evaluation: impact on patient health service use, screening	Evaluation: impact on disease incidence, mortality, quality of life	Economic evaluation
Denman <i>et al</i> , 2014 ³²	Participants who completed the Meta Salud programme demonstrated important physiological changes from baseline to 3-month follow-up. There was a significant decrease in body mass index (BMI), waist circumference, weight, low density lipoprotein (LDL) cholesterol and glucose; they also had a significant increase in high density lipoprotein (HDL) cholesterol	N/A	N/A	N/A	N/A
Goelen <i>et al</i> , 2010 ³²	N/A	The telephone reminder call caused a 22% increase in mammography screening among women who had not attended the Belgian breast cancer-screening programme in previous year.	N/A	N/A	Two hours of volunteer time and 17 telephone contact were needed on average to realise an additional screening of mammogram by the number varied by site. The financial cost is limited if the reminder is operated by volunteers; expense then can be determined mainly by the cost of phone conversations and office space
Hoffman <i>et al</i> , 2012 ³³	N/A	The diagnostic time was shorted for navigated woman than no navigated women. For those who required biopsy, navigated women reached their diagnostic resolution faster than non-navigated women	N/A	N/A	N/A
Honeycutt <i>et al</i> , 2013 ⁶³	The intervention patients were more likely to receive a colonoscopy referral. Patient navigation, delivered through the Community Cancer Screening Program (CCSP) can be an effective approach to promote adherence to screening referrals and to ensure that lifesaving, preventative screenings (colonoscopies) are provided to low-income adults at average risk for colorectal cancer (CRC)	The CCSP is intended to reach low-income individuals. It addresses both system-level and patient-level barriers to screening	N/A	N/A	Not evaluated: out of the scope of the study
Horne <i>et al</i> , 2015 ³⁴	N/A	Patient navigation increased colorectal cancer (CRC) screening	N/A	N/A	N/A

Continued

Table 4 Continued

Impacts/outcomes				
Study	Evaluation: impact on patient behaviours, risk factors	Evaluation: impact on patient health service use, screening	Evaluation: impact on disease incidence, mortality, quality of life	Economic evaluation
Hunter <i>et al</i> , 2004 ³⁵	N/A	Women in the Promotora group were 35% more likely to go for rescreening than those who received a postcard reminder only. Home visits by a CHW showed positive impact on patient's medical service utilisation	N/A	No economic evaluation
Jandorf <i>et al</i> , 2013 ³⁶	Increased colonoscopy screening rate by 15%	Promote adherence to screening colonoscopy	N/A	N/A
Jandorf <i>et al</i> , 2013 ³⁷	High adherence to colonoscopy screening in both peer- patient navigation (PN) and pro-PN group patients	N/A	N/A	N/A
Kegler and Malcoe, 2004 ⁵³	Lead levels and preventive behaviours changes among intervention population. Among Native American children, mean blood lead levels decreased significantly from T1 (6.00 µg/dL) to T2 (4.97 µg/dL) (p=0.047) in Superfund communities and from 4.81 to 3.34 µg/dL (p<0.001) outside the Superfund area	At T1, 14% of the Native American children in Superfund communities had received a blood lead test within the last year; this proportion increased to 29% at T2, we observed improvements among Native Americans in 2 lead prevention behaviours — knowledge about lead poisoning and perceived susceptibility to lead — and in the self-efficacy of 3 lead prevention behaviours	Quality of life improved	N/A
Kieffer <i>et al</i> , 2013 ³⁸	Reduction in the depression symptoms: Depressive symptoms decreased in both the mothers on the move (MOMs) and control groups from baseline to postpartum	N/A	The MOMs intervention is supposed to have reduced the number of participants with high levels of depressive symptoms by half when compared with control participants	N/A
Koniak-Griffin <i>et al</i> , 2015 ⁵⁹	Behaviours: change in diet and physical activity	Reduced waist circumference	N/A	N/A
Krantz <i>et al</i> , 2017 ⁶²	Improvements in low density lipoprotein (LDL) cholesterol or systolic blood pressure (SBP)	An urban, community-based CHW-led programme improved risk factor control for underserved Latinos	N/A	N/A

Continued

Table 4 Continued

Impacts/outcomes		Evaluation: impact on patient behaviours, risk factors	Evaluation: impact on patient health service use, screening	Evaluation: impact on disease incidence, mortality, quality of life	Economic evaluation
Study					
Larkey <i>et al</i> , 2012 ⁴⁰	Participants continue to support healthy behaviour	Higher rate of adherence to cancer screening	N/A	The findings regarding cost suggest that community programmes targeting groups may be not only as effective as one-on-one, time-consuming interventions but also cost substantially less to implement person reached and per screening obtained	N/A
Marshall <i>et al</i> , 2016 ⁴¹	At study exit, a greater proportion of participants receiving the patient navigation intervention reported getting a mammogram than those in the control group (93.3% and 87.5%, respectively; among women who were not screening-adherent at baseline, the incidence of mammography screening at study exit was 73.4% for those in the intervention group, compared with only 45.6% for those in the control group; Among women who were not up to date at baseline, the intervention was associated with a significant increase in the rate of screening at exit (OR 3.63, 95% CI 2.10 to 6.26)	The use of patient navigation services among African-American older women in an urban area increased the odds of self-reported receipt of a screening mammogram by the time of exit from the study. In addition, the association between patient navigation services and mammography was stronger for women who were not up to date with their screening at baseline	N/A		
Mojica <i>et al</i> , 2016 ⁵⁴	Positive changes in cancer screening behaviour and knowledge of screening guidelines and the belief in early detection	Navigation by CHWs increases patient compliance with screening and follow-up of breast, cervical and colorectal cancer screening	N/A	N/A	N/A
Molina <i>et al</i> , 2018 ⁴⁵	N/A	Navigated women having noncancerous result on initial mammogram had higher follow-up screenings (adjusted OR=1.25; 95% CI 1.02 to 1.54) than those receiving standard care	N/A	N/A	N/A
Parra-Medina <i>et al</i> , 2015 ⁵⁵		Vaccine initiation rates in both groups (84%) were substantially higher than the initiation rates reported for Texas (58%) and the nation (65%)	N/A	N/A	N/A

Continued

Table 4 Continued

Impacts/outcomes				
Study	Evaluation: impact on patient behaviours, risk factors	Evaluation: impact on patient health service use, screening	Evaluation: impact on disease incidence, mortality, quality of life	Economic evaluation
Percac-Lima <i>et al</i> , 2016 ⁴²	The patient navigation (PN) intervention improved screening rates among those overdue for breast, cervical and CRC screening	Patients randomised to the PN intervention had significantly higher rates of comprehensive preventive cancer screening compared with patients receiving usual care	N/A	The programme was beneficial for all high-risk patients regardless of age, sex, insurance or language spoken
Percac-Lima <i>et al</i> , 2013 ⁵⁶	N/A	Navigated women had better rates of colposcopy clinic attendance, shorter time to colposcopy clinic follow-up, and a less severe grade of cervical abnormality at colposcopy	The grade of cervical abnormality among navigated women decreased from a numerical score of 2.03 to 1.83 ($p=0.035$) over the two time intervals, while the severity of pathological score in the no navigated group did not change significantly from 1.83 to 1.92 ($p=0.573$) in the same interval. Comparison of trends in pathological score over time showed a decrease in the severity of cervical abnormality for navigated participants compared with the non-navigated group ($p<0.001$)	N/A
Percac-Lima <i>et al</i> , 2014 ⁵⁷	N/A	The rates of screening among Latinos at the community health centre with patient navigators (PN) were as high as the rates among patients who received care in private practices with the primary healthcare network	N/A	N/A
Simmons <i>et al</i> , 2008 ⁴³	The intervention was associated with weight loss in the communities, a major factor in diabetes prevention	N/A	N/A	N/A
Staten <i>et al</i> , 2012 ⁵⁸	The Pasos Adelante programme demonstrated significant decreases in key risk factors for cardiovascular disease (CVD) and diabetes, many of which were maintained 12 weeks after completion of the programme	N/A	Total and HDL cholesterol, and glucose show a downward trend from baseline to programme conclusion and additional declines at follow-up in body mass index (BMI) and hip circumference. BMI, waist and hip circumference, waist-to-hip ratio, and both diastolic and systolic blood pressures were significantly lower at the conclusion of the programme compared with baseline	N/A

Continued

Table 4 Continued

Impacts/outcomes				
Study	Evaluation: impact on patient behaviours, risk factors	Evaluation: impact on patient health service use, screening	Evaluation: impact on disease incidence, mortality, quality of life	Economic evaluation
Treadwell <i>et al</i> , 2010 ⁵⁹	Participant's had greater knowledge about strategies for prevention and management of obesity and diabetes, decreased blood pressure, weight and body mass index levels	Participants visited a primary care doctor more frequently	Participants had increased engagement in exercise and fitness activities	N/A
Wagoner <i>et al</i> , 2015 ⁶⁴	N/A	N/A	N/A	N/A
Wells <i>et al</i> , 2012 ⁶⁰	N/A	Expanding demand of cervical screening, additional demand of colposcopy clinic	N/A	N/A
Wilson <i>et al</i> , 2015 ⁶¹	N/A	Culturally competent patient navigation team and physician — coupled with social support from spouses, partners, family and social networks — may increase the likelihood that Hispanic men will complete CRC screening. The CCMN Programme resulted in a participation rate of 80%; in contrast, only 16% of Hispanic men in care link receiving usual care through the normal referral process reported having received a colonoscopy within 10 years	N/A	Cost-effectiveness analysis suggests that this patient navigator programme increases life expectancy and quality adjusted life years lost (QALYs) and also results in predicted medical cost savings compared with status quo
Woodruff <i>et al</i> , 2010 ⁴⁴	The evaluation for this study was focused on the satisfaction of the community health workers, thus does not focus on the impacts of intervention on patients behaviours. But the community health workers shared satisfaction with their participation in the intervention projects	N/A	N/A	N/A

CHWs, community health workers.

**Table 5** Interventions versus outcomes analysis

Intervention types	Outcomes				
	Impact not measured	Impact on patient behaviours, risk factors	Impact on patient health service use, screening	Impact on disease incidence, mortality, quality of life	Economic impact
Education only (E)	1	9	2	–	–
Navigation only (N)	–	–	9	–	1
Education and navigation (E+N)	–	–	7	1	–
Education and behavioural or self-management (E+SM)	2	6	–	1	–
Quality of study	Weak=3	Moderate=6 (5=E; 1=E+ SM) Weak=9 (4=E; 5=E+ SM)	Moderate=10 (6=N; 4=E+N) Weak=8 (2=E; 3=N; 3=E+N)	Weak=2	Weak=1

The numbers within the table represents the number of included articles.

Types of CHWs role

This review identified four categories of role (ie, education, navigation, support and research) played by the CHWs in preventive care (see table 6).

Under each role, the CHWs took various responsibilities which included some clinical functions such as, under supervision, CHWs provided instructions on holistic clinical approach: infant care, hygiene, skin care, nutrition and accident prevention. It is interesting to note that none of the studies commented on how these CHW's roles were perceived or responded by other healthcare professionals.

Impacts/outcomes

The review extracted interventions and their impacts under five different categories:

1. Health services, quality of care.
2. Patient behaviours, risk factors.
3. Patient health service use, screening.
4. Disease incidence, mortality, quality of life.
5. Health economics.

Impacts of the interventions were most frequently evaluated using quantitative measures. Only one study used a qualitative evaluation of the programme to assess the satisfaction of CHW with their participation in the

Table 6 Role of CHWs

Type of role	Responsibility
1. Educational role	<ul style="list-style-type: none"> ▶ Facilitate the delivery of culturally appropriate interventions in community language. ▶ Under supervision, CHWs provided instructions on holistic clinical approach: infant care, hygiene, skin care, nutrition, accident prevention.
2. Navigational role	<ul style="list-style-type: none"> ▶ Help patients negotiate with the health system to reduce barriers to screening. ▶ Follow-up with participants in person or over the phone. ▶ Promote awareness of the preventive interventions available to the population. ▶ Support participants to make appointments. ▶ Assist patients with transportation. ▶ Provide access to resources, such as food. ▶ Conduct home visits or do telephone follow-ups. ▶ Help patients set weekly goals and record whether those goals were achieved periodically.
3. Support role	<ul style="list-style-type: none"> ▶ Provide social support through developing supportive relationships with participants. ▶ Provide informal counselling and motivational talks to participants. ▶ Participate in physical activity with community members such as walking.
4. Research role	<ul style="list-style-type: none"> ▶ Recruitment of participants. ▶ Conduct interviews and collect quantitative data. ▶ Assessment of behaviour change.

CHWs, community health workers.

project.⁴⁴ Only 1 out of 37 included studies evaluated cost-effectiveness of a navigation programme to colonoscopy among Hispanic men.⁶¹ This study suggested that the patient navigation programme resulted in medical cost saving compared with existing practice as the programme was successful in screening at least 18% of the person contacted by the navigator. The results showed that on average, participants prolonged their life expectancy by 6 months and gained 0.31 additional quality adjusted life years lost (QALYs) compared with not participating in the programme. The study identified an estimated US\$1148 cost saving per participant resulting from participating in the navigator programme compared with controls.⁶¹

The impact on disease incidence, mortality or quality of life was reported only by two studies. One study demonstrated improved infant's health outcomes.⁵⁰ The low incidence of infant deaths suggested that the CHW programme had positive impact on postnatal mortality when compared with prevailing citywide and community rates. Immunisation rates were higher among participants compared with the previous programme and to local and national statistics. The other study identified the positive impact of a culturally tailored patient navigation programme on cervical health outcomes.⁵⁶ The study identified that the grade of cervical abnormality among navigated women decreased from a numerical score of 2.03 to 1.83 ($p=0.035$) over the two time intervals, while the severity of pathological score in the non-navigated group did not change significantly from 1.83 to 1.92 ($p=0.573$) over the same period ($p<0.001$).⁵⁶

Thirty-three studies reported positive impacts of CHW interventions on clinical disease risk indicators, screening rates and healthy behaviours. Clinical measurement of indicators such as low density lipoprotein (LDL) cholesterol level, triglyceride level, waist circumference, diastolic blood pressure, weight and glycosylated haemoglobin (HbA1c)^{28 29 38 39 43 46 48 49 51-53 55 58 59 62} were recorded and analysed from study populations before and after interventions and the results were evaluated based on the changes observed on the indicator measurements. The screening rates were calculated by observing the screening completion rate among the study population.^{30-37 40-42 54 56 57 60 61 63}

In analysing the interventions against outcomes, we identified that 9 out of 12 education only interventions and 6 out of 9 education and self-management interventions showed positive behavioural outcomes. All nine navigation only intervention showed positive health service outcome, whereas seven out of seven education and navigation intervention showed positive screening service use outcomes (see table 5).

Education focused interventions were most effective in changing patient behaviour. Of the 15 studies that identified positive patient behaviour outcomes, 9 were education only interventions and 6 were education and behavioural or self-management interventions. The analysis also revealed that navigation interventions were most effective in improving screening service use. Of

the 17 studies that showed positive screening service use outcomes, 9 studies had navigation only intervention, 7 had education and navigation intervention and two had education only intervention.

Of the studies that investigated health service use outcomes, the majority were classified as moderate quality whereas the studies that investigated behavioural outcomes, the majority were classified as weak quality (see table 5).

Enablers/barriers

All the included studies demonstrated that CHWs had a positive impact on preventive care in PHC settings. Cultural and linguistic congruence between study populations and the navigators was one of the prominent enabling aspects contributing the interventions effectiveness.^{30 32 35 36 39 49 51 56 64} The cultural similarities helped foster trust and build strong relationship between CHWs and study populations. Multiple contacts with the navigators also identified as an important enabling factor in seeking preventive care from the primary care more frequently.⁴⁵ Not only were CHWs able to provide emotional and social support,³⁹ the trusting and confidential relationship between CHWs and the study population enabled CHW to initiate discussion on health-related issues ranging from dietary issues to more sensitive issues such as condom use, cervical cancer screening, mammography screening, sexually transmitted disease (STD) and human immunodeficiency virus (HIV) screening.

Studies identified numerous barriers to the implementation of interventions. Short study duration was identified as barrier to the evaluation of long-term outcomes in some studies.^{31 37 51 63} The lack of generalisability of outcomes to other population groups was identified as a barrier to scaling up of intervention to other setting.^{31 41 42 45 56 57} Some studies also reported difficulty encouraging participants to adhere to the intervention.^{34 40 41 50 54 55} Often study participants were lost to follow-up mid-way through the project. In one study, a large proportion of women were lost to follow-up.⁴¹ The larger dropout rate in the group was attributed to contact fatigue among participants. In one study, CHWs reported that they encountered structural challenges making and having mothers keep vaccine appointments.⁵⁵ Because vaccinations were only offered during business hours, mothers and children were required to take time off work and/or school. The out-of-pocket costs (copays, vaccine coverage) associated with the vaccination plans posed an additional barrier to receiving care.

Developing an effective CHWs intervention model was identified as a challenge that required change and development of new skills. It needed intensive initial training, regular continuing education, and ongoing team building for CHWs and other health professionals involved. In communities that were prone to community violence, ensuring the personal safety of the CHWs while in the field was identified as a challenge in one study.⁵⁰

**Box 2 Roles of CHWs**

1. Cultural appropriate health information.
 2. Navigation.
 3. Coaching and social connect to resources but also social support.
 4. Advocate for individual and community needs.
 5. Provide individual and community capacity building—listening sessions, shared understanding, action team.
 6. Individual and community assessment. Able to provide valuable insights into community problems such as domestic violence.
- CHWs, community health workers.

DISCUSSION**Summary of findings**

In this review, the three main types of CHW interventions to improve preventive care for disadvantaged populations—education, navigation and self-management or combinations of these—were delivered most frequently by mature aged, educated bilingual female CHWs with community experience and training tailored to the intervention. All the studies demonstrated an improvement in at least one outcome—most frequently clinical disease risk indicators, screening rates and change in health behaviours. Navigation interventions tended to have an impact on health service use, whereas education interventions were more likely to result in improvements to patient behaviour. These findings are consistent with systematic reviews of the role of CHW in chronic disease management and navigation to community-based health services.^{65–67} However, these roles represent a narrow range of potential roles for CHWs (text box 2).⁶⁸ Of interest, there is no mention of the clinical preventive roles (eg, monitoring blood pressure, immunisations) that can be seen in underserved settings such as Aboriginal Health Workers in Australia, rural health workers in parts of the USA and maternal and child workers in less developed countries.^{69–71} The expressed roles fit most comfortably with roles 1, 2, 4 above but the roles are very situational specific and, in this review, we identify that the focus is on individuals rather than communities and systems. This is evolving into more sophisticated approaches to health education including coaching, social support and use of social media and involvement in research to build an evidence base for CHWs. There is increased focus on building CHWs into multidisciplinary teams for professional support and increased scope to advocate on behalf of their patients as individuals, health consumers and communities.

In Australia, we can see overlapping roles with CHWs being developed, for example, peer workers in mental and drug health, cultural support workers and bilingual community educators as well as specialised nurses providing outreach services in the community.⁷²

Enablers and barriers to implementation**Enablers**

This review found considerable amount of evidence that CHWs, through their close connections to their

communities and knowledge of patient's values and circumstances, can improve access to health services and ability to benefit from their programmes. There is an authorising environment to develop a strong CHW workforce that will provide community patient and carer engagement. There is also a need for CHWs to support complex management plans for people with multimorbidity being cared for in the community. The fact that a growing number of studies were undertaken in PHC settings is encouraging as these services are the gateway to the wider health system. Creating entry-level positions is important as health systems try to create a diverse workforce that reflects their local communities.

CHWs performed a wide range of roles including helping patients navigate the healthcare system, being a liaison for healthcare appointments and communication, directing patients to services and helping them access community resources. They serve as health educators, provide and reinforce basic health education on disease prevention and management of chronic disease. They also gather patient self-reported health data for researchers. CHWs training and role development in transdisciplinary practice, patient education, resourcing and navigation support facilitate the implementation of CHWs interventions in PHC.⁷³ This is consistent with the literature on the role of CHW and suggests the importance of structural and organisational arrangements to support CHWs.⁷⁴ It is also consistent with implementation science approaches to developing and sustaining programmes across health systems.⁷⁵

Barriers

Reported barriers include the short duration of interventions being studied, ensuring compliance and high rates of loss to follow-up. CHWs training was an important part of intervention implementation but developing effective models of CHW training and maintaining regular continuing education and team building for CHWs together with other health professionals was challenging.

Limitations of the review

The generalisability of results of this study is limited by the small number of studies identified in the review and the variation in the methodological quality of the studies. Although mental health preventive interventions were not excluded, it is possible that some may have not been identified by the search terms for preventive care. The methodological quality of the studies was appraised as moderate or weak. The blinding component of the research data collection was not clearly defined in any studies. We did not exclude studies from our analysis based on the quality appraisal results. Although all studies showed some positive intervention effects, we cannot be confident given the quality of many of these. More evidence is also needed on the sustainability of these interventions, as the studies in the review were short duration and generally conducted follow-up at a period of 6 months or less from the end of interventions.

CONCLUSION

The evidence generated from this systematic scoping review demonstrates the potential contribution of CHWs to improving access to preventive care for patients from disadvantaged backgrounds. There has been a tendency in the literature to focus on the role of CHWs in providing cultural and linguistic connections. However, there is also a need to develop and build on the scope of practice of CHWs especially in supporting navigation to health services and programmes and providing education to support behaviour change. There is an opportunity to examine which model of education is most effective— one-on-one or group sessions—and to examine potential additional benefits such as improvements in social connection among participants in group sessions. It is interesting to note that there was no mention in the studies of how other healthcare professionals responded to the role of CHWs. Working among a team of health professionals is likely to be enabling and to capitalise on the contribution this emerging workforce can make. Given that those who are most disadvantaged are less likely to access healthcare, the impact of navigation support on health services use is especially encouraging.

Patient and public involvement

We did not involve patients or the public in our work.

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