

BMJ Open Community health workers for non-communicable disease prevention and control in Nepal: a qualitative study

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ABSTRACT

Background/objective The increasing burden of non-communicable diseases (NCDs) in Nepal underscores the importance of strengthening primary healthcare systems to deliver efficient care. In this study, we examined the barriers and facilitators to engaging community health workers (CHWs) for NCDs prevention and control in Nepal.

Design We used multiple approaches including (a) review of relevant literature, (b) key personnel and stakeholders' consultation meetings and (c) qualitative data collection using semistructured interviews. A grounded theory approach was used for qualitative data collection and the data were analysed thematically.

Setting Data were collected from health facilities across four districts in Nepal and two stakeholder consultative meetings were conducted at central level.

Participants We conducted in-depth interviews with CHWs (Health Assistants, Auxiliary Health Workers, Auxiliary Nurse Midwife) (n=5); key informant interviews with health policymakers/managers (n=3) and focus group discussions (FGDs) with CHWs (four FGDs; total n=27). Participants in two stakeholder consultative meetings included members from the government (n=8), non-government organisations (n=7), private sector (n=3) and universities (n=6).

Results The CHWs were engaged in a wide range of public health programmes and they also deliver NCDs specific programmes such as common NCDs screening, provisional diagnosis, primary care, health education and counselling, basic medication and referral and so on. These NCD prevention and control services are concentrated in those districts, where the WHO, Package for prevention and control of NCDs program is being implemented. Some challenges and barriers were identified, including inadequate NCD training, high workload, poor system-level support, inadequate remuneration, inadequate supply of logistics and drugs. The facilitating factors included government priority, formation of NCD-related policies, community support systems, social prestige and staff motivation.

Conclusion Engaging CHWs has been considered as key driver to delivering NCDs related services in Nepal. Effective integration of CHWs within the primary care system is essential for CHW's capacity buildings, necessary supervisory arrangements, supply of logistics and medications and setting up effective recording and reporting systems for prevention and control of NCDs in Nepal.

Strengths and limitations of this study

- This study is the first qualitative study of its kind to assess barriers and facilitators to engaging community health workers (CHWs) for prevention and control of non-communicable diseases (NCDs) in Nepal.
- It is a unique study that captured the perspective of various stakeholders (CHWs, health policymakers/managers) through in-depth interview, focus group discussions and consultative meetings.
- The findings of this study provide guidance to development of national policies and guidelines for engaging CHWs for NCD prevention and control.
- This study did not capture the perspectives of services recipients' and was unable to capture perspective beyond four administrative representative districts and central level policymakers, hence limiting the generalisability of our findings.

BACKGROUND

Non-communicable diseases (NCDs) have become the leading cause of death worldwide and are one of the major emerging public health problems.¹⁻³ In 2016, of the 57 million death occurred worldwide, 71% deaths were caused by NCDs.⁴ This burden is alarming in low and middle-income countries (LMICs), where over 85% of premature deaths and 78% of all NCD deaths occur.⁵ The major NCDs responsible for these deaths are cardiovascular diseases (44% of all NCD deaths); cancers (22%); chronic obstructive respiratory diseases (COPD) (9%) and diabetes (4%).⁴ Nepal is facing increasing problem of NCDs.^{2 6 7} The WHO estimated that over 66% of total deaths (age between 30 and 70 years) are attributable to NCDs and NCD-related conditions in Nepal.² A population-based national study from Nepal showed a high prevalence of NCDs, which accounted 11.7% COPD, 8.5% diabetes mellitus, 6.0% chronic kidney disease and 2.9% coronary artery disease.⁷

According to the WHO, STEPwise approach to Surveillance (STEPS) 2013, 17.7% adults



were overweight, 4% obese, 12.3% currently consuming alcohol, 17.8% current tobacco users and only 1.8% were having one serving of vegetable a day.⁸ Further, the survey reported 41% adults with at least one NCD risk factor, 30.9% with two risk factors, 18.7% with three risk factors and 9.0% with four or more NCD risk factors. In recent years, with decrease in the poverty level and increase in the income status of the general population, majority of the population is even more at risk of adopting unhealthy behaviour, which has potential to developing NCDs in the long run.⁹

The rapid increase in NCDs mortality and morbidity in Nepal presents major threat to not only worsening the health situation but also affects overall socioeconomic development of the country, that will ultimately pose threat to achieving Sustainable Development Goals, by 2030.¹⁰ The impact of NCDs on national economy, communities, family and the individual itself is unbearable.^{11 12} The increasing problem of NCDs deplete resources of health systems in Nepal. On the heels of National Health Policy and Multi-sectoral Action Plan for the Prevention and Control of Non-communicable Diseases (2014–2020), Government of Nepal has taken several initiatives such as control of alcohol and tobacco products, promoting physical activity at school level and scaling up Package for Essential Non-communicable diseases prevention and control (PEN).¹³ However, policies related to NCDs are still being discussed without much progress towards their implementation. The health system of Nepal has recently transformed from unitary to three-level federal structure (federal, provincial and local level government), so that the decisions are made at the province and local levels. This system also envisions to addressing the problem of access to and utilisation of health services, in particularly for those people of rural and remote areas. The federal government in the current structure provides conditional grants to the provincial and local government to operate the public health programmes at the local level and the resources generated from the local government are also being used.¹⁴ In recent years, primary prevention at population level has got attention, however, barriers have been identified including the lack of trained human resources and unavailability of adequate health services at peripheral health facilities.^{15 16}

A wealth of evidence base from the LMICs including Nepal shows that mobilising trained community health workers (CHWs) is effective in delivering health education, early detection, case management and lifestyle interventions required to manage NCDs in the community.^{17–19} In Nepal, CHWs are the backbone of public health systems,²⁰ which also led to achieving Millennium Development Goals.²¹ CHWs in Nepal can be divided into two groups: the first group comprises of auxiliary health worker, community medical assistant, auxiliary nurse midwife, health assistant and staff nurse, who undergo certified training courses to provide preventive and basic health services. The second group comprises of Female Community Health Volunteers (FCHVs) who are

volunteer workers at the community level. The FCHVs are mostly engaged in delivering preventive and promotive services for maternal and child healthcare and communicable diseases and moreover, they play a pivotal role in linking communities with peripheral health facilities.²²

While Nepal is committed to offer universal access to essential health services for NCDs, no options to supplement the existing primary healthcare delivery system have been identified. Information on the training of CHWs, the process to deliver interventions through CHWs and the effectiveness of CHW-led intervention is lacking. Identification of the facilitators and barriers to CHW-led implementation of NCD-related services can provide policymakers and practitioners with a portfolio of options to address the growing demands for NCD-related healthcare services. Therefore, in this study, we aimed to explore the barriers and facilitators of engaging CHWs in delivering NCD-related services in Nepal.

METHODOLOGY

Study design

This study used multiple approaches including (a) review of relevant literature, (b) key personnel and stakeholders' consultation meetings and (c) collection of qualitative data using semistructured interviews. Despite the government of Nepal's recent initiatives to NCDs prevention and control, such as National Health Policy; Multisectoral NCD plan; Universal Health Coverage and WHO PEN package, potentials for engaging CHWs for NCD service delivery have not yet received greater attention. We used a grounded theory approach^{23 24} involving key informant interviews (KIIs) with policymakers and in-depth interviews (IDIs) and focus group discussions (FGDs) with CHWs. Grounded theory has considerable significance to qualitative research involving participants from diverse background. This approach provides explicit, sequential guidelines for conducting qualitative research, offers specific strategies for handling the analytic phases of inquiry, streamlines and integrates data collection and analysis process and advances conceptual analysis.²³

Study sites

This study was conducted in both urban and rural areas of the selected four districts (Kathmandu, Dhading, Nuwakot and Nawalparasi) of Nepal. These study districts are selected purposively and are the ones where the WHO Package for Essential Non-communicable disease prevention and control (PEN) programs are ongoing.

Patient and public involvement

Patients, public and the healthcare workers were not involved in the conception of this study, development of the research question and interpretation of the results or manuscript writing.

Participant selection

The participants of this study included policymakers at the central level and CHWs at the community level. The participants at the central level were selected based on their direct and indirect involvement to the development and implementation of NCD-related policies and strategies, whereas the CHWs at the primary healthcare level were selected based on their involvement with providing patients' consultation services. The female community healthcare volunteers are the ones who provide disease prevention and health education services at the village levels. Convenient sampling was used to identify and select these participants for this study.

Study tools development

The current study was a part of a multicountry study conducted in selected countries of Asia and Pacific regions,²⁵ therefore we adapted the study tools to Nepal's context from the prototype guidelines developed by the multicountry project team. The development of qualitative interview guides was guided by extensive review of relevant literature, government reports and guidelines, existing tools and consultation with government officials at the Director General of Health Services and Ministry of Health Nepal. Further, consultation with CHWs was held in order to incorporate their and patients' perspective in terms of NCDs prevention and control in Nepal. The study team and NCD experts reviewed the interview guidelines in order to ensure face validity. The tools, which included KII, IDI and FGD guidelines, were translated into Nepali language by a bilingual professional translator and back translated into English. Following thorough review of the guidelines, necessary revision was done in order to ensure contextual and culturally sensitive to Nepalese context. The guidelines focused on five key areas including (1) CHW's current practices on general health services, (2) practices on NCD-related programmes, (3) barriers to implementing general and NCD-related services, (4) facilitators and enabling factors to delivering NCD-related services and (v) feasible approaches to enable CHW's to deliver NCD-related services and facilitate appropriate referral and follow-up.

Data collection

Using purposive sampling, we collected data from four districts including Kathmandu, Dhading, Nuwakot and Nawalparasi. Four main approaches were used for data collection (1) two stakeholders' consultative meetings with senior government and non-government officials, researchers, academician and clinicians (n=24), (2) four FGDs (two FGDs in rural and two FGDs in urban areas, n=27) with CHWs and (3) KII with policymakers at the central level (n=3) and (4) IDIs with CHWs (n=5). One stakeholder meeting was held at the beginning of the study where the preliminary comments and insights into the study were gathered from the participants. Another meeting held at the end of the study was focused on sharing the preliminary findings of the study and their suggestions and comments to the findings were gathered and incorporated to the study. The KIIs with policymakers and managers were focused on determining challenges to development and implementation of NCDs and related policies and strategies. The FGDs were focused on gathering information dealing with patients with NCDs at the health facility and at the community levels; and the IDIs were involved in gathering individual-level experience providing services for patients with NCDs. The main approaches used in data collection are provided in table 1. Data were collected during April and July 2017. All interviews were conducted by two trained research officers (ROs) from HERD International Nepal, a national research-based organisation in Nepal. All interviews and discussions were conducted in local Nepali language and were audio recorded; one RO led the discussion while another RO took notes during the data collection. The local Principal Investigator (SB) of the study examined the quality of the initial transcriptions with the audio records to confirm that the transcribed content was consistent with the participants' voices. After finishing all the quality checks of initial transcription, the two ROs with the close supervision of PI and the consultant conducted interviews and discussions.

Data processing and analysis

Interviews were transcribed verbatim by one of the research team members (CK). Coding of the transcripts and the identification of emerging themes

Table 1 Approaches used for qualitative data collection

Data collection types	Number of participants
In-depth qualitative interviews	5 IDIs with CHWs
Key informant interviews	3 KIIs with central level policymakers and health managers
Focus group discussion	2 FGDs with health workers and 2 FGDs with FCHVs, n=27
Stakeholder consultative meetings	One at the beginning of the study and one at the end of the study) with participants from government (n=8), NGOs (n=7), private sector (n=3) and universities (n=6)

CHW, community health worker; FCHV, female community health volunteer; FGD, focus group discussion; IDI, in-depth interview; KII, key informant interview; NGO, non-governmental organisation.

were carried out using a thematic approach as recommended by Nowell *et al.*²⁶ The conceptual mapping of the themes emerging from the data was achieved by careful reading and rereading of transcripts against the research questions. The process of coding involved an inductive approach and the common themes were identified by comparing and contrasting the patterns and meanings as expressed by participants. Two researchers (LBR and CK) independently read the transcripts and did coding and analysed the qualitative data; these were further checked by another two researchers (ASA and SB) for accuracy. All team members reviewed the final themes and a consensus was achieved resolving the discrepancies through discussion. A final set of three major themes was identified and the qualitative findings are presented, accordingly. These include (1) NCDs specific programmes delivered by CHWs in Nepal, (2) difficulties and challenges in engaging CHWs in NCDs prevention and control and (3) facilitating and enabling factors in engaging CHWs in NCD control & prevention.

The collection and analysis of data from qualitative interviews adhered to the Standards for Reporting Qualitative Research (SRQR)²⁷ and strategies were employed to enhance the trustworthiness (credibility, transferability, dependability, confirmability and transferability) of the study findings.^{28 29} This included checking the data for accuracy, organising debriefings for completeness of data (LBR, CK and UNY). See Appendix-A, SRQR Checklist as online supplemental document.

RESULTS

Participants' characteristics

The details of the participants' characteristics are presented in table 2. Of total, 12 health facilities included in this study, 5 were from the urban setting, 4 from the rural setting and 3 from the central level (Ministry of Health and Department of Health Services). The qualitative interviews and FGDs with CHWs were conducted in health facilities (five from urban setting and four from rural setting). The interviews with policymakers/managers were conducted in Ministry of Health and Department of Health services. The majority of the participants was within the age group of 40 and 50 years old. In terms of gender, relatively more women were interviewed in the urban and rural health facilities, whereas all three KII participants were men at the Ministry of Health and Department of Health Services.

NCD-related health service delivered by CHWs in Nepal

The common NCD services being provided by the CHWs from the peripheral health facilities included basic screening of common NCDs (hypertension and diabetes in particular), health education and counselling and support for early diagnosis including laboratory tests if available, prescribing basic medication for hypertension and diabetes and recording of NCD services and referral of patients when needed. In general, the primary health-care centres, in Nepal, are equipped with laboratory facility, whereas the health posts and urban health clinics are not yet equipped with laboratory facilities. The laboratory test and dispensing of medication are provided only if these facilities are available at the health centres.

Table 2 General characteristics of the FGD participants (n=27), IDI participants (n=5) and KII participants (n=3)

Characteristics	FGDs (4 FGDs; total participants, N=27)	IDIs (N=5)	KIIs (N=3)
<i>Work setting</i>			
Rural health centres	3	2	
Urban health centres	1	3	
Central level health facility			3
<i>Age by category</i>			
20–29	8	2	
30–39	6	2	
40–49	8	1	3
>=50	5	5	
<i>Gender</i>			
Male	2	2	3
Female	25	3	0
<i>Duration of job in the public health facilities</i>			
<10 years	15	3	1
10–19 years	6	1	1
20–29 years	6	1	1

CHW, community health worker; FCHV, female community health volunteer; FGD, focus group discussion; IDI, in-depth interview; KII, key informant interview; NGO, non-governmental organisation.

In general, many of the peripheral health facilities in Nepal lack these facilities. One CHW expressed:

We do what we can after the patient arrives here first of all. We are trying to provide them with all the facilities that we have. We do have a lab service too. We “test” them and we “normally” try to do all the possible treatments here. We provide treatments if they do not have anything “strong” [severe condition]. Otherwise, we “refer” them to the “higher” [level] “central”, the district hospital or the Bhairahawa Medical College. Those are our referral areas.—IDI-3, HA, PHCC, Nawalparasi district

At the health posts with no laboratory facilities available, the CHWs diagnose hypertension but no other NCDs because of lack of resources and capacity. Suspected patients are referred to Primary Health Care Centre (PHCC) or a district hospital for diagnosis of NCDs. Once the diagnosis is confirmed and a treatment is initiated, follow-ups are done at the Health Post (HP) level. One CHW said:

Based on the signs and symptoms reported by patients we suspect the cases and we ask them to check for diabetes in some other health facility. It is because we do not have laboratory services available in our health facility.—IDI-1, ANM, Urban health clinic, Kathmandu district

In line with the services being provided by the FCHVs, one FGD participant told:

... whenever any patients come to us, we advise them to go to the health centre or hospital as soon as they can. We do provide health education and counselling, such as do not smoke, no alcohol, eat healthy food and check blood pressure etc. to patients. Since we do not have any medicines for it [NCDs], we always refer them.—FGD-3, FCHV-5, Dhading district

To date, there is no systematic approach in place for a referral and follow-up of a patient from one health facility to another. These are up to the patient to choose the health facility they want to go for further investigation and management. It was noted that in the urban areas, patients generally opt to go to specialised hospitals in search of better services but in rural areas people often reach public peripheral health facilities to receive the available care. Despite the aforementioned practice, CHWs also mentioned several instances where the patients visit PHCCs or HPs for NCDs services due to high NCDs care cost in the private health facilities. One CHW shared her experience:

Yes, we obviously refer because we cannot do everything from “diagnosis” to “management” ourselves. At [the referral site] even though there is a “social service center”, but because of “carelessness” at higher centre, several “patients” have returned saying “we did not get [the service]. If a proper care and

management at the referral center could be improved, it would be easier for the patients.—FGD-1, Staff nurse, PHCC, Kathmandu district

Notably, CHWs mentioned that they usually provide basic advice and counselling for common NCDs to the people who come to see them. The FCHVs were providing advice related to dietary habits, importance of physical activity, health education and other lifestyle issues in order to prevent NCDs.

Barriers and challenges to engaging CHWs in the NCD prevention and control services

This study identified several challenges and obstacles to engaging CHWs for NCD prevention and control in Nepal. The barriers and challenges are mainly related to lack of trained human resources, high workload, inadequate training, poor system-level support, inadequate remuneration, delivery of services and the availability of resources. The challenges are structured in the following key subthemes:

Lack of trained human resources for health

Inadequate trained human resources at the health facilities (both in terms of availability of already trained personnel as well as training opportunities) were identified as one of the major barriers to NCD prevention and control services in Nepal. Unavailability of required number of health workers at the health facilities often has resulted in increased workload on the existing staff, thus impacting the effective health services delivery including NCD services. CHWs expressed that they were not yet capacitated in delivering NCD services. One CHW expressed:

There is nothing for the Non-Communicable Diseases. We [CHWs referring to HA and AHW] are the health professionals who have to consult many cases at the health facility throughout the day but no capacity [trainings] to manage the conditions, so far.—IDI-5, HA, PHCC, Nawalparasi district

CHWs shared that they were interested to deliver NCDs focused activities, once their capacity is built in the domain of NCDs. Currently, NCD services at the peripheral health facilities are confined to simple counselling and health education for behaviour/lifestyle change and are not very much effective in terms of overall prevention and control of NCDs. One CHW said that:

Indeed, we require training about Non-Communicable Diseases management. Who is responsible for the “management” of NCDs? I do not know...How can it [NCD program] be moved forward? Where are the places that we could “refer” them [the patients] under which condition? If we were given the information about these things beforehand, it would be better. Along with that, the “equipment” and “facilities” that are available also

need to be clarified.—IDI-2, ANM, District health office clinic, Nawalparasi district

Lack of human resources and frequent transfer of staffs were considered as important challenges to deliver NCDs and other healthcare services through the health centres. However, the FGD participants also shared that the problem of vacant positions at health facilities is now gradually decreasing as the Nepalese government has taken initiatives to fulfil sanctioned vacant posts in all health facilities by deploying newly recruited health cadres. One of the FGD participants shared her views:

There are sufficient sanctioned positions, but all of them are unfulfilled. When any health workers go for emergency holiday or to participate in the training, there is no one to replace in his/her absence to keep the services running. Such position remains vacant and services are affected for some time until the health worker/s return to work.—FGD-2, ANM, HP, Dhading district

The policy-level stakeholders confirmed that NCD-related services are being delivered currently (as of July 2017) in only few districts and also acknowledged that there is inadequate training of health workers on NCD prevention and control. When policymakers were asked about the future plans for NCD care and management, they stated that they are planning to execute a phase wise expansion of the WHO PEN intervention across the country in coming years. One KII indicated that:

We have so far, over 10 districts in the country, introduced WHO PEN package for prevention and control of NCDs. The health workers are being trained on WHO PEN and the government of Nepal, the ministry of health, is committed to delivering NCD services and we plan to expand this to other districts in near future. —KII-1, Health Manager, Department of Health Services, Kathmandu

Lack of regular supply of essential medication

Most participants in FGDs and KIIs were concerned about the timely supply and availability of free essential drugs in the health facility. This compels patients to purchase the NCD medicines from private pharmacies, thus adding to the unaffordable out of pocket expenses to the patients. Consequently, health workers reported to have faced the wrath of the patients. One FGD participants stated:

..... we wish we don't need to send the patients to buy medicine from the private drug shop, but what to do? the medicines are not supplied at the health facilities in time and the patients also have to take the medicine regularly, such as for high blood pressure, lifelong medicine is required. So, we have no choice than sending the patients either to district hospital or to private clinic.—FGD-1, AHW, PHCC, Kathmandu district

Another participant expressed that the requisition for medicines usually was made every 3 months to the district public health office, whereas the medicines were supplied only when they were available. In most cases, delay in supplies of medicines from logistic department hampered the regular supply of medicines to the people with NCDs.

For the outpatients, the type of medicines dispensed depends on the available medicines and supply. We always try to provide whatever medicines are available at our health facility.—IDI-5, HA, PHCC, Nawalparasi district

Further, the health facilities were facing other logistics-related challenges such as shortages of adequate space, lack of furniture and inadequate necessary instruments to deliver NCD-related services.

Facilitating and enabling factors in engaging CHWs in NCD prevention and control

Role of Health Facility Management Committee

The participants mentioned that having Role of Health Facility Management Committee (HFMC) set up in each health facility is one of the key facilitating factors to NCD services delivery. However, their capacity, accountability and transparency have been questionable to ensure quality of health services. The participants opined that there is a need for improving capacity of HFMC to resolve the issues at the health facility level, such as fulfilling trained human resources to retention of CHWs, availability of supplies and medication and making available basic equipment and diagnostic services.

Fulfilling vacant positions in all health facilities

The government of Nepal has taken initiative to fulfil the vacant positions at the health facilities. The participants thought that by fulfilling the vacant positions, preferably with skilled CHWs, their workload would be reduced which would encourage expansion of NCD services. One participants said that:

Government of Nepal has taken good initiative to fulfil the vacant positions in all health facilities, however we need these new CHWs to be available as soon as possible and more importantly, their retention to assigned health facility should be maintained at least for 2 years—IDI-3, HA, PHCC, Nawalparasi district

Personal job satisfaction

CHWs in general were satisfied with their services to the community, as they receive respect in return. The CHWs also stated that their satisfaction level even goes up when they see tangible health improvement of those patients they serve. One of the participants shared:

I feel really proud and satisfied that I have got opportunity to serve my people in my community. When someone says that I have done a good job, I feel very

happy, but even more responsible—IDI-4, ANM, District health office clinic, Nawalparasi district

CHWs as key drivers to NCD prevention and control

Most of the participants in the KII and the stakeholder consultation meetings viewed that the CHWs could play a vital role for NCD prevention and management services. One KII highlighted:

Traditionally, the CHWs have been trained and given tasks to deliver communicable diseases and related services. However, the situation in Nepal is changing—we have majority of the people dying due to non-communicable diseases. The CHWs can play vital roles to prevention and management of NCDs. Of course, we need to provide appropriate training for them—KII-2, Health manager, Department of Health Services, Kathmandu

The policymakers also suggested that CHWs working in health facilities could be given a referral card to facilitate timely referral of serious cases to the nearest health facilities at the district, provincial or federal level public hospitals.

Collective efforts for NCD prevention and control

The policy-level KII participants and stakeholders stated that the Ministry of Health has given high priority to NCDs prevention and control in Nepal. There had been high level of commitment from government too. However, there is a need for working together and collaborating with other relevant ministries and sectors than health to optimise the efforts for NCD prevention and control. Participants also shared that there had also been realisation that the non-state sector could play a vital role to this effort. One participant highlighted:

We have developed a range of NCD related policies and strategies. We also have a department in the ministry dedicated to NCDs related programs. However, there is a need for working together with other relevant ministries too' KII-3, Health policy maker, Ministry of Health, Nepal

DISCUSSION

Like many other LMICs, Nepal, in recent years, are experiencing the growing burden of NCDs, posing major threats to the existing weak healthcare systems in the country.^{30 31} In this context, our study is the first of its kind to explore barriers and facilitators to CHWs potential engagement in delivering NCD-related services in the country. Our findings determined the role and extent of CHWs and what is required further to engage CHWs in the prevention and control of NCD efforts in Nepal. The government of Nepal has taken initiatives at systems and service delivery levels including development and implementation of a number of NCD-related policies and action plans.¹³ Given the shortages of trained human

resources for health in the country, the government of Nepal also has taken initiatives to production, deployment and retention of trained human resources for health (HRH).³² Maldistribution and poor rural retention of trained HRH are global concerns including in Nepal, which also had received attention at policy and service delivery level.³³ Shortage of skilled human resources for NCD service delivery is another major threat to the health systems of Nepal.³⁴ Therefore, findings of this study have provided important insights into address the shortages of HRH in the country.

Findings of this study suggest that the CHWs in Nepal are one of the major drivers of delivering preventive health and NCD-related services. The CHWs also provide various NCD-related services. Some key NCD-related services include screening and basic management of common NCDs (ie, hypertension and diabetes); health education and counselling; support to medication adherence and recording and reporting of NCD services. The FCHVs who are part of the grassroot/village-level healthcare providers are engaged with providing health education and counselling, linking patients with the health facilities and providing social and emotional supports; there is also a strong and established FCHV network across the country.²² Providing counselling and health education may be effective in educating public about specific health issues, however, these may not be adequate to change NCD-related risk behaviour. Emerging evidence shows that imparting health literacy and activating patients in an encapsulated way may be more effective approach to behaviour change for those with chronic conditions.^{35 36}

Previous studies suggest that engaging CHWs for delivery of health services and health promotion interventions is increasing in LMICs and proven to be effective.^{17 18 37} CHWs provide opportunities for easy implementation of health promotion interventions within the existing healthcare service delivery channels without engaging new personnel with whom families have had no prior contact. Several countries in the South and South East Asian regions (ie, Bangladesh, China, Nepal and Vietnam) have delivered different public health programmes through CHWs; and the effectiveness of these programmes is reported.^{38–40} However, scaling up of these programmes and integrating these within the existing healthcare delivery system are important to deliver ongoing general health as well as NCD-related services in a low-income country like Nepal.

In our study, we found high motivation among the CHWs to deliver services that would halt the NCD epidemic in the country. In contrast to findings from previous study,²² participants in our study did not report any kind of overburden of works while performing their day-to-day jobs. They even expressed high level of willingness to involve with delivering NCD and related services for the community in their catchment area. The contribution of CHWs to deliver NCD-related services in the country cannot be underestimated and their contribution can be seen as a key factor to achieving Millennium Development Goals

in Nepal. Results from our study are in concordance with the findings from other settings, where CHWs expressed the need of capacity building for the prevention and control of NCDs.^{41 42} These findings are plausible because in past decades, the CHWs were very much capacitated on maternal and child health activities and were mostly dealing with communicable diseases. However, there had been a shortfall of skilled CHWs and accessibility to health services for combating the growing demands for NCDs services at the peripheral level health facilities.^{15 43}

Our findings suggest that the current healthcare system of Nepal is not well prepared to mitigate the growing burden of NCDs in the country. A number of key barriers both at systems and service delivery levels in Nepal were identified: (1) lack of appropriate NCD policy guidelines, (2) insufficient trained human resources, (3) inadequate logistics, supplies and medications, (4) lack of laboratory facilities, (5) inefficient referral mechanisms and (6) unavailability of systematic recording and reporting systems. These findings corroborate well to the ones reported in another recent study from Nepal⁴¹ as well as other neighbouring countries.^{43–45} Studies in Nepal have reported that despite implementation of the WHO PEN package, government's role has been very limited to providing NCD-related services to combat the growing burden of NCDs in Nepal.³⁴ Developing a functional team and a service delivery system in resource poor setting like Nepal is possible and has been highlighted by several studies, however, there is a need for translating these potentials to action.^{16 25 46} The recently implemented (2016–2018) phasewise implementation of the WHO PEN package in over 36 districts has brought opportunities to develop strategies for NCD prevention and control efforts in Nepal; integration of CHWs within this PEN initiative should be considered.²⁵

Strengthening primary healthcare for tackling the growing burden of NCDs in Nepal is critically important. The CHWs who are based at community health centres, on appropriate training, could play a pivotal role in screening, diagnosis and early management of NCDs.²⁵ They could also be trained to play important roles in imparting health literacy and tailoring behaviour change communication. In order to achieve the universal health coverage and ensure country meets NCD-related Sustainable Development Goals (SDGs) targets by 2030,¹⁰ Nepal would require restructuring of the traditional healthcare delivery system to address healthcare workforce disparities that exist in rural and remote regions. Also, country would need to take multifaceted approach and collaboration among professions and institutions that have traditionally used vertical approach. Engaging CHWs to prevention and control of NCD efforts would improve public access to primary healthcare for NCDs. Evidence shows that CHW's involvement to the delivery of primary healthcare can potentially result in cost and time savings without compromising the quality of care or health outcomes for patients.^{38–40}

However, re-engineering the health workforce will need to be implemented along with restructuring of the health systems including training of CHWs in new skill sets, providing them with disease-specific training as well as screening and management protocols; and where available, giving CHWs the ability to prescribe from a restricted list of medications, in consultation with physicians/medical doctors.⁴⁷ Further, there is a need for developing a functional model to deliver NCD programmes through revitalised primary healthcare approach with the involvement of CHWs, who could essentially coordinate the care. Adding to this, while the government of Nepal is grappling with the financial challenges for implementing NCD programmes, using codesign approach for designing a model of care could be another avenue to plan, implement and sustain NCD-related programmes effectively in the country.⁴¹

Limitations

One of the key limitations of this study was, due to the resources limitations, we were unable to include beyond four districts of Nepal. Also, we did not gather data from the policymakers beyond the Health Ministry and the Department of Health Services at central level. Having data available from additional districts as well as the quantitative data could have added additional insights into make the findings more generalisable. Also, we conducted four FGDs without following information saturation to decide the need for additional FGDs. However, given we collected data using different approaches including secondary literature review, qualitative interviews, consultative meetings and FGDs, we believe the information that we have summarised are adequate to address the research questions for this study. Further, we were unable to collect data from the patients or community members, which could have added insights into the service recipients' perspective but was out of the scope of this study.

CONCLUSION

The study highlighted the potentials for using CHWs for NCD prevention and control in Nepal. Several barriers and facilitators for CHWs' potential engagement to deliver NCD-related services in Nepal have been identified. Our results offer options to policymakers and researchers for integrating CHWs in the delivery of community-based interventions for NCD prevention and control in Nepal and other similar low-income countries. To combat the growing burden of NCDs, effective integration of CHWs within the primary healthcare system is essential. This would require policy support for CHW's capacity buildings and necessary supervisory arrangements to deliver NCD-related programmes in the country. Further, we recommend developing and testing of model interventions to train CHWs and to deliver CHW-led NCD prevention and control programmes in Nepal.

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Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in this article. Additional data could be available upon request to the corresponding author.

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Community health workers for non-communicable diseases prevention and control in Nepal: a qualitative study

	Standards for Reporting Qualitative Research (SRQR)*	Page/ line no.(s)
Title and abstract		
	Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	P1, lines 01-02
	Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	P2
Introduction		
	Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	P3, lines 15-43 P4, lines 01-26
	Purpose or research question - Purpose of the study and specific objectives or questions	P4, lines 15-26
Methods		
	Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	P4, lines 29-39
	Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	P4, lines 29-31
	Context - Setting/site and salient contextual factors; rationale**	P4, lines 40-41, page 5, lines 1-2
	Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	P5, lines 33-34
	Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	P5, lines 29-32
	Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	P5 lines 33-41, Page 6, lines 1-12, and Table 1

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	P5, lines 13-28
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	P5 lines 33-38, and Table 1
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	P6, lines 13-20
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	P6, lines 21-25
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	P6, lines 26-30
Results/findings	
Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	P6, lines 33-41 P7, lines- 1-40 P8, lines 1-41 P9, lines 1-39 P10, lines 1-35
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	P7, lines 10-15, 20-22, 25-28, 36-40 P8, lines- 18-21, 26-31, 38-41, P9, lines 6-19, 16-20, 25-27 P10, lines 5-8, 12-14, 18-22, 33-35
Discussion	
Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	P10, lines 38-40 P11, lines 1-43 P12, lines 1-38
Limitations - Trustworthiness and limitations of findings	P12, lines 39-42 P13, lines 1-7
Other	
Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	P13, line 33
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	P13, lines 25-32

	<p>*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.</p>	
	<p>**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.</p>	

Reference

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. [Standards for reporting qualitative research: a synthesis of recommendations](#). *Academic Medicine*, Vol. 89, No. 9 / Sept 2014

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