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Engaging community health workers to promote oral health for people living with type 2 diabetes mellitus in Nepal: a qualitative study

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Abstract

Background People living with type 2 diabetes mellitus (T2DM) are likely to develop oral health problems, and vice versa. The burden of oral health and T2DM is increasing, especially in low- and middle-income countries. Access to oral health care remains a challenge in many countries, including Nepal. This study examined the challenges and opportunities for engaging community health workers (CHWs) in promoting oral health care among people with T2DM in Nepal.

Methods This study used a qualitative research design using key informant interviews (KIIs) and in-depth interviews (IDIs) responding to open ended questions. Data were collected from health facilities across two districts, Kavrepalanchowk and Kathmandu. The IDIs were conducted with CHWs, including health assistants ($n=7$) and community medical assistants ($n=4$) from rural and semi-urban areas, while the KIIs were conducted with policy makers and health managers at central level ($n=7$). Data was analysed thematically.

Results The participants highlighted the importance and need for providing integrated oral health services at the primary care level. However, they pointed the challenges including (i) lack of policies, guidelines and provision of oral health care, especially for people with T2DM, (ii) lack of capacity on oral health among the CHWs, and (iv) inadequate resources and supplies at primary health care settings. These gaps presented opportunities to develop targeted policies and CHW training by ensuring continuous supervision and appropriate incentivisation, facilitating the integration of oral health care at primary health care level in Nepal.

Conclusions The findings of study highlight the potential for engaging CHWs to deliver oral health services for people with T2DM at the primary health care level in Nepal. Strengthening the health system and building capacity of CHWs, along with continued supervision, incentivisation and supply of adequate resources could facilitate the integration of oral health services into primary health care settings in Nepal.

Keywords Oral health, Diabetes mellitus, Community health care workers, Primary health care, Integration, Nepal

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Background

Oral diseases are the most common noncommunicable diseases (NCDs) globally, affecting 3.5 billion, which represents around the 45% of the global population [1, 2]. There is growing evidence of a bidirectional relationship between oral diseases and other NCDs, particularly periodontal diseases and type 2 diabetes mellitus (T2DM) [1–3]. Periodontal diseases, such as gingivitis and periodontitis, are one of the significant complications of T2DM [4–6]. Gingivitis is an inflammatory condition in the soft tissues of the gingiva in response to the microbial plaque on teeth [4–6]. Gingivitis causes periodontitis by destroying the supporting structure of the teeth leading to tooth loss [7]. Evidence supports a bidirectional relationship between periodontal diseases and T2DM: People living with T2DM have a higher risk of developing periodontal diseases, and periodontal diseases negatively affect insulin resistance and glycaemic control [8–10]. Non-surgical periodontal treatment can improve both periodontal conditions and glycaemic control [8–10]. Additionally, oral diseases and T2DM share common risk factors such as an unhealthy diet, tobacco smoking, and excessive alcohol consumption [11]. The global burden of periodontal diseases and T2DM is increasing, particularly in low- and middle-income countries due to population aging, urbanisation, lifestyle changes, a decrease in the burden of infectious diseases and improved health services delivery [12, 13]. Despite this, access of oral health service remain a challenge globally due to the dominance of a dentist-centred workforce model with limited interprofessional collaboration [1, 2]. The World Health Organization suggests integrating essential oral health services into primary health care as a strategy to address the growing burden of oral diseases and their links to other NCDs, including T2DM [14]. This aligns with the Global Oral Health Action Plan 2023–2030, which envisions achieving Universal Health Coverage (UHC) for oral health by 2030, ensuring that all individuals and communities have access to essential, quality health services without financial hardship [1, 14].

Nepal faces challenges similar to those seen globally. Recent studies in Nepal highlighted an increasing burden of NCDs as a result of economic growth and lifestyle changes, with T2DM as emerging public health issue [15, 16]. A systematic review in 2020 estimated the prevalence of prediabetes and diabetes were 9.2% and 8.5%, respectively [15]. However, these figures may have been underestimated due to a lack of diagnosis and surveillance systems for T2DM in the country [15, 17, 18]. Moreover, there has been a growing burden of periodontal diseases, with estimated prevalence increasing from 8.0% in 1990 to 11.3% in 2019 [19]. This represents an increase of 1.8 million cases over the past 30 years in Nepal [19]. Despite concerns about the comorbidity of T2DM and oral diseases, there is a shortage of oral healthcare professionals available to prevent, detect, manage, and treat oral diseases. Globally, there is an average of 3.3 dentists per 10,000 people in 2022, but Nepal had only 1.25 dentists per 10,000 people in 2020 [20]. Essential oral health services, such as oral health screening, urgent oral disease treatment for pain relief, and basic restorative dental procedures, are reported as unavailable in primary health care levels in Nepal due to the uneven distribution of oral health professionals [21, 22].

In 2013, the Ministry of Health and Population Nepal endorsed a National Oral Health Policy, which included six objectives: (i) promoting oral health and controlling oral diseases; (ii) ensuring universal access to oral health services; (iii) strengthening continuous surveillance, monitoring, evaluation, and research; (iv) prioritising oral health in health policies and systems; (v) collaborating with other sectors beyond oral health; (vi) improving the health system [22]. The last objective, improving the health system, emphasises the importance of providing oral health training to primary healthcare workers by delivering basic training on oral health [22]. However, while the policy underscores the need for an integrated approach to oral health services in primary health care settings, it does not specify how to implement oral health training for CHWs nor how CHWs will implement oral health promotion in primary health care settings [22].

Community Health Workers (CHWs) are the backbone of Napal health care system and have played a crucial role in reducing child and maternal mortality [23, 24]. CHWs receives up to 2 years of training, following high-school education [25, 26]. They are deputed at the community health centres, where they provide preventive services, including health education and counselling, as well as preliminary curative services [25, 26]. The role of CHWs also encompasses the NCD-related programmes, including those for T2DM, where they provide health education and counselling, screening, provisional diagnosis, basic medication and referral [17]. Given the global burden of oral diseases and T2DM, and the challenges faced by countries, including Nepal, in delivering essential oral health services, it is crucial to explore how CHWs can be effectively engaged in promoting oral health among people living with T2DM [1, 14]. Therefore, the aim of this study was to explore challenges and opportunities for engaging CHWs in promoting oral health among people living with T2DM.

Methods

Study design

This study employed a qualitative research design using key informant interviews (KIIs) and in-depth interviews (IDIs) responding to open ended questions. This method was appropriate as we aimed to explore the

understanding, experiences, views, and perspectives of the policymakers, health managers, and CHWs regarding the potential for engaging CHWs in the prevention and management of oral health problems among people with T2DM at primary health care settings in Nepal.

Setting

This study was conducted in Kavrepalanchowk and Kathmandu districts in Nepal. Kathmandu district is the capital of Nepal, which encompasses urban, semi-urban, and rural areas. The participants of this study from Kathmandu district were policy makers and health managers located in the urban settings of the district. Kavrepalanchowk district is one of the 75 districts of Nepal, covering an area of 1,396 square feet situated in the mid-hilly region including rural and semi-urban areas [27]. It has a total population of 380,000, with approximately 183,000 (52.1%) males and 199,000 (52.1%) females, and Dhulikhel is the district headquarters [27]. The adult literacy level is 62.8%, and the income per capita is 1399 USD [27]. While there is no recent comprehensive oral health survey at Kavrepalanchowk district, high prevalence of NCDs risk factors, including unhealthy diet, tobacco use and alcohol consumption, has been reported in this district [28]. This oral health qualitative study was a substudy of an ongoing research assessing the effectiveness of community-based, culturally appropriate lifestyle intervention to manage T2DM among people living with T2DM in Kavrepalanchowk district [29]. This qualitative study was conducted prior to the initiation of the main intervention. The intervention, which began in 2022, included 12 group-based sessions, each lasting one hour, provided twice monthly over a 6-month period. The session includes related to diabetes care, ongoing support, supervision and monitoring, follow-up from the trained CHWs, and one module on oral health [29]. The CHWs were identified from Kavrepalanchowk district, while policymakers and health managers were chosen from Kathmandu district, where the Ministry of Health and Population and those key personnel were located.

Sampling strategy

Purposive sampling was used to determine the participants of this study, allowing us to capture a broad range of perspectives and experiences, ensuring that the individuals included had various backgrounds relevant to the research interest [30]. Additionally, for IDIs, snowballing sampling was employed alongside purposive sampling to identify additional participates through referrals from initial interviewees, thereby broadening the scope of perspective gathered. The participants for KIIs ($n=7$) were selected based on their involvement in oral health and T2DM-related work and contribution in this area at the central government level in Kathmandu district. This included representatives from the curative division at the Ministry of Health and Population, NCDs and mental health section of the epidemiology and disease control division at the Ministry of Health and Population, the Nepal dental association, and the diabetes and endocrinology association of Nepal. The policymakers and health managers were chosen at central level to provide their views and perspectives on the strategic direction of national oral health governance and the implementation of national oral health policies in Nepal. The participants of IDIs ($n=11$) were identified from the pool of CHWs who were working in the two community health centres of Dhulikhel Hospital in the rural areas ($n=2$) and three health facilities run by public sector in Kavrepalanchowk district in semi-urban areas ($n=9$). All participants provided consent to participate. This approach facilitated gathering insight into the implementation of central policy at the primary health care level, reflecting how policies are translated into practice. While the KIIs represent those at the central level, we conducted IDIs until we reached saturation of the information required for this study.

Study tools development

The semi-structure guide was developed through an extensive review of relevant literature, including government reports, national and interventional guidelines on oral health and T2DM, and relevant available tools in these topics, via PubMed, Google Scholar, and website of the Ministry of Health and Population Nepal. The semi-structured interview guide was chosen for its ability to balance structured data collection with flexibility need to capture the comprehensive information, ensuring that key topics are consistently covered while allowing participants to provide in-depth perspectives [31]. The search was conducted using three primary concepts (oral health, diabetes mellitus, and guidelines and policy), which was combined using Boolean operators. Medical subject heading terms were also used as appropriate. The keywords regarding oral health were: oral health, oral hygiene, or dental care. The keyword related to diabetes were diabetes or diabetes mellitus. Lastly, the key words relating to guidelines or policies were guidelines, manual, protocol or policy. The thorough literature review on oral health and T2DM provided insights into the magnitude of these issues, as well as the current situation and contextual understanding of oral health guidelines, strategies and programmes globally, regionally, and within Nepal. This review guided us in identifying key topic areas for further research in the context of Nepal. Following this, the study team, experts on oral health and T2DM, developed the topic guide to ensure that the core areas of the study were covered. The semi-structured interview guides for KIIs and IDIs were developed in English and

translated into Nepali by a bilingual researcher and then back-translated into English. To ensure the face validity of the questions in the interview guide, this was reviewed by the subject experts in oral health and NCD fields, and their comments were incorporated into the revised interview guide. Following this, the interview guide was pilot tested among three CHWs from different districts than the study site to access contextual appropriateness, clarity and content validity. Feedback from these CHWs was also incorporated into the final version. The KII guide for policymakers focused on five areas, including (i) the current burden of oral disease concerning T2DM in Nepal; (ii) government policies, strategies, or action plans and their implementation status, including its monitoring efforts, to address the burden of oral disease among people living with T2DM; (iii) collaborative partners or agencies facilitating policy implementation, including examples and challenges; (iv) financial sources facilitating policy implementation; (v) opportunities and challenges for engaging CHWs to prevent, detect and manage the burden of oral diseases among people living with T2DM. The IDI guide for CHWs focused on four areas, including (i) knowledge about oral diseases concerning T2DM; (ii) perceptions of the importance of oral health for people living with T2DM; (iii) oral health services provided in community health centres; (iv) opportunities and challenges for engaging CHWs in delivering oral health services at community health centres (See supplement material).

Data collection

The KIIs and IDIs were conducted to explore participants' perspectives on the opportunities and challenges of engaging CHWs to promote oral health among people living with T2DM in Nepal [32]. The KIIs with policymakers were conducted using an online meeting platform, Zoom, to accommodate researchers who were not based in Kathmandu to minimize the risk of coronavirus disease 2019 (COVID-19) transmission. For the IDIs, nine interviews were conducted face-to-face in the meeting hall of community health center, which was quiet and free from external noise. The remaining two interviews were conducted via telephone because they were not available for a face-to-face interview. Data were collected between June 2021 and August 2021. The KIIs were facilitated by three researchers (PG, DP, and LR), and the IDIs were conducted by a researcher (PG). All the interviews were performed in Nepali, audio recorded, and transcribed verbatim. The detailed filed notes were taken during and immediately after each interview session, including participants' non-verbal behaviour and any contextual factors that might have influenced the interview. No other individuals other than the participant and interviewer(s) were present during the interviews. The investigators who conducted the interviews had oral health and T2DM backgrounds. Moreover, they share common language (Nepali) and cultural background with most of the study participants, which helped establish trust and build rapport, making participants feel comfortable enough to share information openly during the discussion. Although virtual interviews can sometimes limit non-verbal communication, the interviewers' shared language and cultural background played a crucial role in overcoming these barriers, ensuring that participants were able to engage meaningfully in the discussion. The research team consisted of three females (YH, PG, HS) and three males (DP, TS, and LR), each with varying levels of experience and seniority. YH, PG and DP have background of dentistry with over 5 years of experiences in NCDs prevention and management, as well as implementation and qualitative research. HS, TS and LR have over 20 years of experience in the infectious and NCDs prevention and management, epidemiological studies, health systems and policy, and implementation science research, all with qualitative research experience. Participants did not receive any direct benefit from participating in this study. However, we made it clear prior to interview that the results of this study would contribute to policy and service delivery to improve oral health among people with T2DM in Nepal.

Data processing and analysis

Recordings were transcribed verbatim and translated into English by one research team member (PG). To ensure the accuracy of translation, the transcripts were individually read and re-read several times by two researchers (PG and PD), who collaborated to discuss and resolve any discrepancies or ambiguities. This iterative review process was essential for capturing the intended meaning of the data after transition. Field notes were systematically reviewed and incorporated into the data analysis to provide supplementary information and contextual understanding. The thematic analysis was conducted using an inductive approach, which involved several steps. Initially, researchers (YH and PG) familiarized themselves with the data through repeated reading of the translated transcript to gain an in-depth understanding, which was further checked by another researcher (LR) for accuracy. Initial codes were generated to identify and label key elements within the data. These codes were then examined for patterns, leading to the identification of themes that captured significant aspects of the data. The identified themes were reviewed for consistency and relevance to ensure clarify and precision. Each theme was clarified defined and named to accurately reflect its content. Generated codes were later merged to derive themes. The final themes were shared with other team members for review and all researchers agreed to the final coding

Table 1 Characteristics of the participants

	KIIs (*n* = 7)	IDIs (*n* = 11)
Sex		
Male	6	8
Female	1	3
Age		
20–29 years		4
30–39 years old	1	3
40–49 years old	4	3
50 years and above	2	1
Work setting		
Rural health centres		2
Semi-urban health centres		9
Policy level representatives	7	

framework and confirmed themes, ensuring a rigorous and comprehensive analysis as outlined by Nowell et al. (2017) [33]. The analysis was conducted using manual coding method with Micorsoft Word. The collection and analysis of qualitative interviews followed the Standards for Reporting Qualitative Research while ensuring credibility, transferability, dependability, and confirmability [34, 35]. As the interview was conducted in Nepali and then translated into English, some quotes were edited to increase clarity for readers while maintaining the same meanings.

Patient and public involvement

No patients or members of the public were involved in the design of this study.

Results

Participants

The characteristics of the participants are shown in Table 1. Among the 18 participants of this qualitative study, 14 were male and 4 were female. The CHWs had various qualifications; there were seven health assistants and four community medical assistants. All qualitative interviews, including KIIs and IDIs, lasted between 15 min and 45 min. Some interviews were shorter, but focused on the specific topics and captured targeted aspect of the study. Four major themes were identified, these included (i) The current situation and challenges concerning oral health and T2DM; (ii) Approaches to addressing oral disease burden among people living with T2DM; (iii) The roles and knowledge of CHWs; (iv) Approaches to engaging CHWs on oral health and T2DM. This shows overlaps between the topics covered in the semi-structured interviews and the themes identified through the analysis, suggesting the effectiveness of the interview guide in addressing the core areas of interest related to the research objective.

The current situation and challenges concerning oral health and T2DM

This study identified an insufficient commitment to oral health at the health policy level, such as a lack of oral health services coverage as part of the universal health coverage (UHC) benefits package. Thus, the accessibility and affordability of oral health care remain the challenge. One participant said;

> *The challenging part is there is no government insurance system in place for basic oral health services. Access to oral health services is not appropriate for people in the low- and middle-strata of society as it [the government insurance system] covers only extraction or dental trauma. Without insurance, the burden of oral diseases increases. — KIIs 1, Oral health and T2DM expert.*

Another participant explained about the insufficient political commitment;

> *Oral health is almost in the shadow of the Ministry of Health. [....] Now that there is a different and new department for oral health named the curative division, hopefully, these sectors will be given more attention in the future. The reason for the neglect is that other NCDs, such as hypertension, diabetes, chronic obstructive pulmonary disease, and cancer, are major public health issues that have only recently begun to be addressed. — KIIs 2, Oral health and T2DM expert.*

There is a lack of awareness about oral health among the general public, leading to insufficient preventive measures and delayed oral health care, which exacerbates oral health problems.

> *Oral health is neglected in our part of the world [Nepal]. People are told to visit dentists only if they present with problems. — KIIs 5, Oral health and T2DM expert.*

Another participant said:

> *Overall, oral health issues are not treated with the same urgency as other health problem, which contributes to their neglect. [....] For oral health care, people rely on analgesics by gargling with warm saline to relieve the pain caused by teeth, believing the pain will eventually go away. — KIIs 2, Oral health and T2DM expert.*

Moreover, some stakeholders mentioned that, despite the linkage between oral health and T2DM, understanding

this association is insufficient from the medical side, including physicians and endocrinologists. One participant said:

> *Our understanding is that while dentists have improved their understanding [of the association between oral health and T2DM], in the medical field, understanding of oral health is still lacking— KIIs 1, Oral health and T2DM expert.*

The current referral system between the dental and medical fields, especially in regards to T2DM, is not well established. A participant highlighted the need for an integrated referral protocol between oral health and T2DM;

> *As a general rule, there should be a referral system with a protocol between endocrinologists and dental surgeons. As soon as a new case [of T2DM] is diagnosed, they [the endocrinologist] should send the patient to the dental department. In this way, oral health counselling can be done, methods to promote oral health can be taught, and oral diseases can be prevented, which is really lacking in our country. — KIIs 7, Oral health and T2DM expert.*

Approaches to addressing oral disease burden among people living with T2DM

The need for the development of guidelines on oral health for people living with T2DM was suggested to strengthen an integrated approach by establishing a referral pathway. This requires a better coordination mechanism between dental and T2DM stakeholders across the public and private sectors. Oral health services should be integrated, not only for T2DM but also for broader NCD programmes at the primary health care level, due to the shared risk factors between oral health and NCDs. Moreover, CHWs could play a role to provide basic oral health services. One participant said:

> *A more coordinated approach has to be developed between organizations and associations, educating them [CHWs] about oral health. If there are patients in for regular screening or routine follow-ups [for diabetes], they [CHWs] can ask a few questions regarding oral health, such as gum swelling, bleeding, and tooth mobility, within 10–15 s or they can make their patient open their mouth and they can identify the conditions in the mouth and refer those patients [with problems] to dentists. — KIIs 6, Oral health and T2DM expert.*

The roles and knowledge of CHWs

CHWs engage with various health conditions on a daily basis, including communicable diseases such as COVID-19 and dog bites, as well as NCDs such as hypertension, T2DM, asthma, Chronic Obstructive Pulmonary Disease, and oral diseases. CHWs who joined IDIs had a basic understanding of NCDs and their risk factors, such as an unhealthy diet, physical inactivity, and tobacco smoking. However, not all CHWs were aware of the association between oral health and T2DM. The number of patients who visit health centres due to either oral diseases or T2DM varied between CHWs, ranging between 2 and 50 patients per month. The type of oral health services provided in health centres depends on the availability of resources and previous training. A few CHWs with oral health training provide basic oral health services, such as basic tooth extractions and necessary medicines, including antibiotics and analgesics. Other CHWs refer all people with oral diseases to dentists without providing any oral health screening or examination, yet accessibility to the referred dental clinic remains a challenge. One participant mentioned the lack of accessibility to dental care;

> *Barhabise's nearest dental clinic is 16–17 km away, taking 35–45 min [to travel there]; it is more difficult to reach in the rainy season — IDIs 7, CHW.*

Approaches to engaging CHWs on oral health and T2DM

The development and implementation of guidelines that define an integrated oral health and T2DM program by CHWs was suggested. Following the guidelines, the training materials for capacity building of CHWs should be in place to screen, provide basic oral health care, and refer to dentists as needed. The majority of IDI participants were keen to get basic oral health training if there were appropriate equipment disseminated to provide oral health care services in their health centres. The importance of the continuity of training and supervision to follow up on the implementation of oral health services was emphasised. However, a few CHWs mentioned that additional engagement in oral health would be a burden to their routine roles. The need for the strategy to engage CHWs in oral health was suggested with appropriate incentivisation was suggested to promote better adherence. One participant said;

> *Female community health volunteers are already over-burdened, providing them knowledge [about oral health] is not a big thing, but they are already over-burdened with the vaccination program, family planning, health education, and others. [....] Instead of female community health volunteers, the auxiliary nurses, midwives, auxiliary health workers, auxiliary nurse midwives can be involved and*

higher to them, staff nurses and health assistants. The training manual can be developed, and they can be trained on oral health for not more than 1.5 to 3 days depending upon the content. — KIIs 2, Oral health and T2DM expert.

Furthermore, CHWs should be given equal opportunities to get training. One participant mentioned their previous experience with the training;

Even if all [CHWs] are interested in [training for oral health] from a health centre, only 2–4 people will get the opportunity. — IDIs 6, CHW.

Discussion

This study provides important findings regarding the potential role of CHWs in delivering oral health programs for people living with T2DM in Nepal. To our knowledge, it is the first study to explore the perspectives of policymakers, health managers and CHWs on the challenges and opportunities associated with engaging CHWs in promoting oral health among people living with T2DM in Nepal. The study identified several challenges: the absence of specific policies and provisions on oral health particularly for those living T2DM; a lack of guidelines or training for CHWs; insufficient capacity among CHWs; and inadequate resources for delivering oral health services in primary health care settings. Given the increasing burden of oral disease and T2DM comorbidity, this study underscores the importance of integrating oral health care with T2DM services in primary health care settings through education and training of CHWs.

Our findings showed that oral health has not received adequate attention at the government level. Despite the implementation of the social health insurance system in Nepal's public sector since 2016, oral health services are limited in the benefits package except for extraction, draining of abscesses, and primary management of dental trauma [36, 37]. Previous studies have suggested that social insurance should cover basic oral health services, including prevention, promotion interventions, urgent oral treatments, and atraumatic restorative treatments, with broader population coverage and enhanced financial protection to achieve UHC [36–39]. Financial protection is crucial for increasing the uptake of these interventions by population [40]. Furthermore, this study highlights a general lack of oral health awareness among Nepalese population. While a previous study from Nepal reported that 90% of adults brushed their teeth more than once per day in 2019, this proportion had decreased from 97% in 2013 [41]. Moreover, only 5% of the population reported ever visiting a dentist [41]. Strengthening the social insurance system to include coverage for preventive and promotional oral health could contribute to raising awareness and address the delayed oral health care. Additionally, our study reveals that governments' efforts to promote oral health, particularly for people living with T2DM, are insufficient. The National Oral Health Policy does not address the management of oral diseases for people living with T2DM, and the referral system is not established well despite the linkage between oral diseases and T2DM [8–10, 22]. However, policymakers, health managers, and CHWs involved in study supported the need to strengthen the oral health service provision for people living with T2DM. Timely diagnosis and referral of oral manifestations in people living with T2DM are crucial, as periodontal treatment could improve not only oral health status but also glycaemic control [8, 9, 42].

The challenges and opportunities observed in Nepal may be relevant to other countries, especially in low- and middle- income countries facing similar issues in delivering essential oral health care, especially for those with T2DM. Our study suggests that engaging CHWs in oral health promotion for people living with T2DM could service a model for addressing oral disease burden. A systematic review conducted in 2022 reported that oral health promotion delivered by non-oral health care professionals could be effective among people living with T2DM [43]. Our study findings show that the knowledge, skills and oral health services provided by CHWs depend on their previous training and resource availability in their health centre. The majority of CHWs have not received any oral health training and lack understanding of the association between oral diseases and T2DM. However, some trained CHWs provide basic oral health services at their health centre when appropriate equipment is available. The CHW expressed the need for regular monitoring of their CHW performance and capacity through a supervision system, along with appropriate incentivisation. This aligns with previous, which reports that CHWs are concerned about low incentives despite their workload and the lack of opportunities for continuous training [17, 44]. Several factors contribute to the motivation of CHWs, including appropriate incentives, personal growth and professional development opportunities and the sense of the do-ability within their roles and responsibilities [45].

This study has some limitations. It included CHWs from only one district, and conducting IDIs with CHWs from multiple districts could have provided additional insights, leading to more generalizable findings across Nepal. Additionally, this study did not include interviews people or members of the community who have an oral disease and T2DM, which could have highlighted recipients' perspectives. Furthermore, transcripts were not returned to participants for comments or correction due to resource limitation, including transportation and

time constraints. This step could have helped ensure that participants' views and opinions were accurately transcribed. Despite these limitations, this study identified a clear need to strengthen the health system to address the comorbidity of oral disease and T2DM. CHWs could play an crucial role in integrating oral health services in primary health care settings in Nepal. Future research is needed to develop oral health training which is feasible, acceptable, and effective for CHWs to improve oral health status among people living with T2DM in Nepal.

Conclusion

This study provides valuable findings on the potential for utilizing CHWs to promote oral health among people living with T2DM in primary health care settings in Nepal. A number of important health systems and service delivery challenges were identified, including the lack of policies and provisions on oral health, particularly for people living with T2DM, along with the absence of oral health guidelines or training for CHWs, a lack of capacity among CHWs and inadequate resources to deliver oral health services in primary health care level. Despite these challenges, policymakers, health managers, and CHWs emphasized the need to develop policies specifically targeting oral health for people living with T2DM, allocate adequate resources, build CHWs capacity, and integrate oral health services as part of the NCD services at the primary health care level in Nepal. The development and implementation of oral health guidelines are crucial for reinforcing the effective engagement of CHWs in promoting oral health for people living with T2DM. Additionally, incorporating basic oral health prevention and promotion into the national health insurance scheme, along with CHW capacity building with continued supervision and appropriate incentivisation, is essential for sustaining the effective engagement of CHWs in oral health initiatives in Nepal. Future studies should focus on developing oral health training for CHWs to facilitate the integration of oral health services in primary health care settings.

Abbreviations

CHWs	Community Health Workers
COVID-19	Coronavirus Disease 2019
IDIs	In-depth Interviews
KIIs	Key Informant Interviews
NCDs	Non-communicable Diseases
T2DM	Type 2 Diabetes Mellitus
UHC	Universal Health Coverage

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12875-025-02711-6.

Supplementary Material 1

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Author contributions

YH, PG, DP, TS and LR contributed to conceptualising the study, drafting the manuscript and finalisation. YH, PG, DP, and LR contributed to data collection and analysis. YH, PG, DP, HS, TS, and LR reviewed the manuscript, contributed substantially to revision, and approved the final version of the paper.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted according to the guidelines laid down in the Declaration of Helsinki. This study is part of an ongoing larger research project in Nepal, which uses a randomised controlled trial for diabetes self-management in Nepal including oral health management. Ethics approval of this study has been obtained from the ethics review committees of Nepal Health Research Council, Nepal, the Ethics Review Committee of Tokyo Women's Medical University (200801), Japan, the Institutional Review Board of Kathmandu University, Nepal (#944/2019P), and the Human Research Ethics Committee of Central Queensland University, Australia (#CQU RSH/HE 0000022453). Verbal informed consent was obtained from all participants who participated in interviews via Zoom or telephone, and written informed consent was obtained from participants who were interviewed in person, which was approved by the ethics review committee of the Nepal Health Research Council, Nepal. Participants' approval was sought prior to audio recording the interview. The privacy and confidentiality of each participants' information gathered during the interviews is strictly maintained.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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