

Impact of a Community Dental Worker Program in Ifakara, Tanzania

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Background

Oral diseases are a major global public health problem affecting over 3.5 billion people.¹ Moreover, it has been recognized that dental decay is the most common non-communicable disease globally^{2,3}, and that the significant impacts of this disease, such as pain, financial burden, time off work or school etc., are distributed unequally in populations, with the poorest, most marginalized groups suffering the highest burden of oral diseases.⁴ In high-income countries, the current treatment-dominated, increasingly high-technology, interventionist, and specialized approaches are failing to tackle the underlying causes of disease and are not addressing inequalities in oral health. In low-income and middle-income countries, the limitations of so-called westernized approaches to dentistry are at their most acute; dentistry is often unavailable, unaffordable, and inappropriate for the majority of these populations, but particularly the rural poor.⁴ The consequences of these disparities in access to oral health care have a strong influence not only on oral health but on overall health as well. Poor oral health can lead to malnutrition, and serious, and sometimes fatal, infections. Poor oral health is associated with diabetes, heart disease, and premature births. Oral disease in pregnant women and young mothers can be transmitted vertically to their offspring, perpetuating a cycle of disease.⁵ Rather than being isolated and separated from the mainstream health-care system, dentistry needs to be more integrated with primary care services.^{3,4} Dental care systems should focus more on promoting and maintaining oral health and achieving greater oral health equity. Sugar, alcohol, and tobacco consumption, and their underlying social and commercial determinants, are common risk factors shared with a range of other non-communicable diseases.⁴

Health workforce (HWF) is a significant predictor of the universal health coverage service coverage index (UHC SCI). Attaining at least 70% of the UHC SCI requires about 134.23 health workers (a mix of 13 cadres) per 10 000 population. To this end, the WHO has declared that countries in the WHO African region should accelerate investments in health, especially in the HWF, towards a density of 134 per 10 000 to attain high UHC coverage score.⁶ In estimating the threshold of HWF densities in Africa by occupational group, ISCO-08 code (dentists and dental technicians/assistants) were calculated at 0.74 regional density per 10 000 population. This same report states that a density score of 5.28 per 10 000 population is required for at least a 70% UHC Services index.⁶

Provision Charitable Foundation (PCF) has been supporting both traditional (i.e., sending health care teams and support staff) and transformational (i.e., sending teams to educate and introduce systems to continue to teach these applications to successive generations within the local community) approaches to improving health conditions in developing regions of Tanzania, but aims for more transformational change where possible. In 2016 and 2017, members of PCF began to consider the state of oral health in the Ifakara area of Tanzania, an area with a severe lack of trained oral health care providers (1 dentist, 7

dental therapists in a population of 205 843 (2022); 0.34 per 10 000 population). Dental decay was noted as a significant problem in the area. Through a traditional approach, volunteer dental treatment clinics staffed by Canadian clinicians associated with PCF were deployed. A pilot assessment of the dentitions of children at 4 schools in Ifakara and Mahenge, in the Morogoro region of Tanzania revealed not only that there was high number of dental problems including decay and others, but that these problems varied in prevalence, depending on the school environment, and surrounding. These findings, together with the 2016 publication, Promoting Oral Health in Africa⁷, has strongly influenced The Oral Health team at PCF who have come together with St. Francis University College of Health and Allied Sciences (SFUCHAS) and have stated a strong position that adapting an innovative workforce that focuses on primary prevention, is a model that has the potential to substantially impact the prevalence of oral disease in this region. This transformational approach is supported by reports from WHO that show oral diseases are among the most common non-communicable diseases and may affect people throughout their lifetime, causing pain, disfigurement and even death. New models must be explored to ensure that people suffering from pain and illness caused by oral diseases and conditions are not left without treatment. Fortunately, most interventions needed to address most day-to-day oral health needs are proven, affordable, and feasible in the places where ordinary people live and can be carried out by non-oral health professionals at the primary health care level. To this end, PCF has collaborated with SFUCHAS to develop and implement a mechanism to provide oral health education to the community as preventive measure to the problem.

The community oral health program in Ifakara was initiated in 2021. This involved hiring three locally trained community health workers (CHW), providing additional oral health specific training, educational materials, and other resources to begin the long-term project, and renaming them as community dental workers (CDW). Community outreach took place in reproductive and child health clinics (RCHs), community outreach clinics as well as in primary schools. Before the community outreach began, permissions from the Permanent Secretary Ministry of Health, Morogoro Regional Medical Officer and Ifakara Town Council Director were sought. Permissions were granted by all the levels which enabled the CDW to access the clinics and primary schools without hindrances. Since Nov 2021, to the present, this dental oral health program has been piloted to community members in nine (9) Wards of Ifakara Town Council in Morogoro, Tanzania. Program mobilization and expansion to access additional wards are in planning phase. The participants have been mostly, mothers/parents who attend RCH clinics and primary school pupils in few selected schools. To date, our experience confirms positive results. It is Provision Charitable Foundation's hope to scale up this program.

The foundation acknowledges that upscale of this program will require numerous coordinated and sustained actions, with special attention to the distinct and varied needs of the nation's vulnerable and underserved populations. Achieving this goal will require flexibility and ingenuity among leaders at the national, district, ward, local, and community levels acting in concert with oral health and other health care professionals. To determine

the effectiveness and efficiency of this training programme, formal evaluation is an essential element.

Purpose and Aims

In May of 2022, St. Francis University of Health and Allied Science (SFUCHAS) conducted an evaluation of the Oral Healthcare Community Dental Worker (CDW) programme using the Kirkpatrick Evaluation Model.⁸⁾ Kirkpatrick's Evaluation Model has four levels of evaluation: reaction assessment, learning assessment, behaviour assessment, and results Assessment. In this report the first three levels (reaction, learning, and behavior) were evaluated.⁹⁾ However, level 4, which determines the results, or the overall success of the training was not evaluated at that time because the overall impact requires longitudinal assessment, and the initial evaluation was done immediately after the completion of the training.

In 2023, PCF partnered with Dalhousie University's Faculty of Dentistry in Halifax, Nova Scotia, Canada to discuss and design a follow-up evaluation plan and assessment of the CDW program in Ifakara, Tanzania. In addition to addressing the need for longitudinal (level 4) assessment of program impacts, a need was identified to expand programme evaluation, and a multi-phase/multi-arm proposal was drafted involving qualitative and quantitative research arms. In 2024, a team from Dalhousie and PCF met to discuss mobilizing the qualitative arm of the proposed program evaluation, and more specifically focus groups with current CDWs to better understand their training experiences and perceived impacts of the CDW program and delivery of oral health education sessions to communities within Ifakara. This arm of the program assessment sought to evaluate the critical return of the training by determining tangible results of the community oral health education program being delivered by CDWs in Ifakara. The specific aim was to explore the experiences and perspectives of CDWs delivering oral health education in Ifakara, and to identify successes and challenges of program delivery and for improving oral health outcomes within local communities.

Program Evaluation Design

Methodology

This qualitative program evaluation was guided by pragmatic theoretical frameworks and grounded in participatory action research (PAR). PAR is largely considered a methodology

concerned with social change and is a favourable methodology by which to explore sociocultural and political needs. PAR includes systematic processes of data collection and analysis to produce knowledge for the purposes of “taking action and making change”.¹⁰ PAR was selected as an appropriate methodology to conduct this evaluation as it necessitates and directly involves community members (CDWs), whom have an agenda to improve their own/community situation. PAR allows the evaluator and the participants to assume roles as co-collaborators and knowledge creators and involves pooling collective knowledge, perspectives and experiences together to define issues and derive informed solutions”.¹¹ The pluralistic and diverse perspectives offered by CDW participants about their experiences leads to rich data and interpretations which stands to inform meaningful social action and response for improving oral health in Ifakara.

Participants and Setting

A purposeful sample of 8 CDWs trained under the Community Oral Health Program between 2017-2022 and actively practicing as CDWs were invited to participate. Participants consented to participate in facilitated focus group sessions to better understand their experiences and perceptions of training received and impacts of oral health education delivery within local communities in Ifakara. All participants had experience providing oral health education sessions to the 9 wards currently served by Provision Charitable Foundation’s Community Oral Health program and identified as community members themselves. Demographic information was not collected from participants as it is not necessary outcome data.

Data Collection and Tools

Focus groups

Data was collected using focus groups. Two focus groups (FG1, FG2) were conducted (n = 4/session) using virtual-conferencing software (Zoom) in September 2024 lasting 60 minutes in duration. Virtual focus groups were dually facilitated by a remote member of the research team at Dalhousie who is trained in qualitative focus group moderating (L.V.D.) and not involved in the training of CDWs or affiliated with PCF. The sessions were also facilitated on-site by a PCF organizational member (S.M.), who is from Tanzania and fluent in Swahili, for purposes of facilitating discussion and real-time translation.

Semi-structured interview guide

A flexible set of guided-discussion questions was developed by a member of the research team (L.V.D.) and subsequently reviewed and revised by all team members prior to piloting in this study ([Appendix A](#)). The guide was used by the focus group facilitators to guide participant discussion; however, participants were encouraged to freely discuss their perceptions of the program training, resources and materials, perceived participant

engagement with the education sessions and perceived challenges and successes of the program.

Recording and transcription

Focus group sessions were video-recorded (Zoom video-conferencing platform) and transcribed in English for analysis. Following transcription, transcripts were also de-identified, and each participant assigned a pseudonym to maintain participant anonymity and for use of any quotes in this report. All participants gave informed consent to participate in this evaluation.

Limitations

A limitation to the data is that one focus group recording (FG2) could not be retrieved following completion due to unforeseen technological issues on-site in Ifakara. Data collected from this focus group session was therefore derived from field notes taken by the lead focus group facilitator (L.V.D.) at time of interviewing. Field notes were triangulated with FG1 data and thematic findings to promote authenticity in the findings.

Data Analysis

An inductive approach to data analysis was used. The FG1 transcript was analyzed independently, and initial analysis was performed by a single member of the research team (LVD) for identification of preliminary themes. Thematic interpretation of the transcript involved processes of reading and re-reading to identify pertinent and stand-out quotes and perspectives from participants on their experiences as CDWs and categorizing quotes by codes. Preliminary findings and thematic interpretations were then shared amongst the wider research team. A copy of preliminary findings and themes was shared with participants for review. Throughout the data analysis phase, new knowledge and emerging themes were triangulated across research team and participant members, and as well as with previous research and existing reports to refine and establish final themes. Involvement of CDW participants served to confirm authenticity in the interpretation and the thematic presentation of participants' experiences and perspectives. All parties approved the final themes as presented.

Findings

Data analysis revealed three major themes related to CDW’s perspectives and experiences of oral health program delivery and impacts within local communities in Ifakara. These three themes were: 1) empowering oral health through education, 2) challenges to transformative change, and 3) becoming future change agents. An abbreviated version of these findings is available as [Appendix B](#).

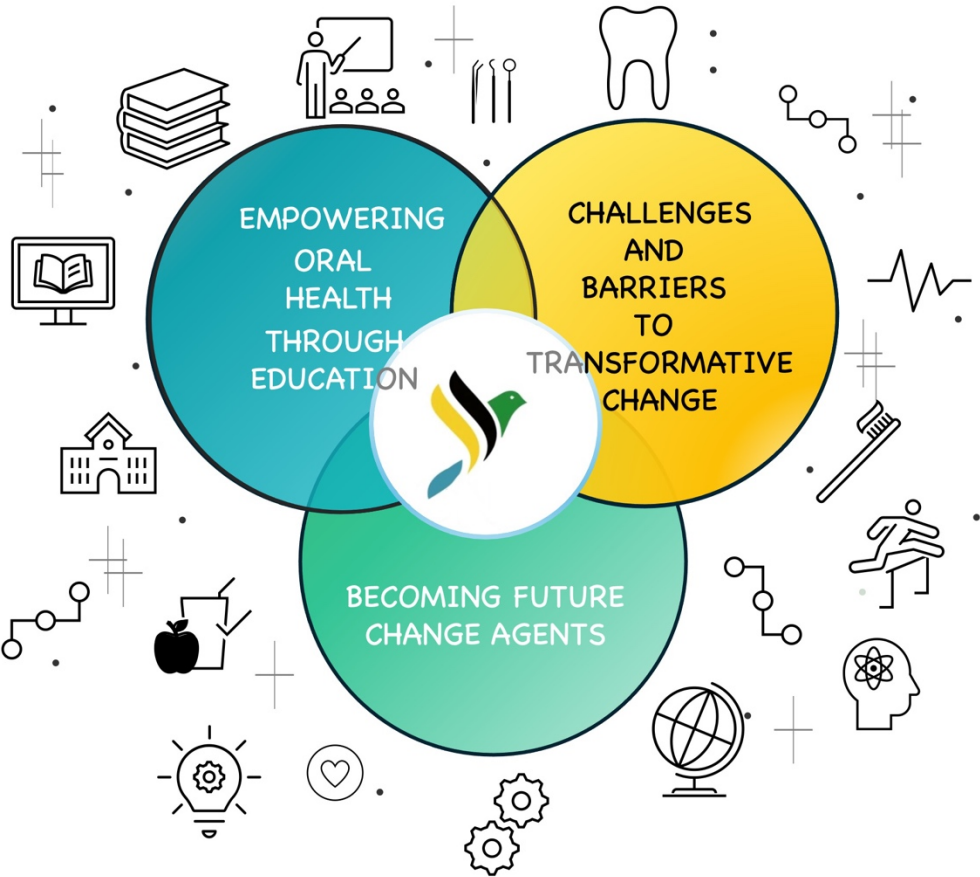


Figure 1. Community dental workers’ perspectives and experiences.

Empowering Oral Health Through Education

Since its inception, the Oral Healthcare Community Dental Worker Programme was described by CDWs as a key resource that enabled implementing and mobilizing positive changes for oral health within local wards/communities. Participants also offered positive reflections on the training and education they received to become a CDW, citing that the content prepared them well to assume their role as oral health educators within communities.

Notably, participants imparted the significance of the program in effecting positive change at two levels: the individual and community level. Many CDWs offered examples of how their training positively impacted them personally. The majority of participants cited that the educational content they received on oral health during training was eye-opening to their own understanding of links between oral and overall health and best practices for oral health maintenance. For P3, a mother of young children, her training enhanced her own knowledge of proper oral care for children. She offered:

“The education and training has been impactful, even for myself. When I first had my kids, I didn't think that you had to brush their teeth just after getting their first tooth or the second tooth... I was waiting until the mouth was full with teeth.”

In addition to eliciting positive changes to her personal homecare habits, she imparted how she was able to pass this new knowledge on informally to other family members and parents in her daily life as well as formally through her community oral health education sessions.

“Now that I've been exposed to taking good care of your oral health, I always encourage parents not to wait until all the gums are full of teeth, but the minute the child has their first tooth... to start encouraging brushing or using a cloth to clean those gums.”

Other participants described how becoming a CDW and having the opportunity to provide oral health education sessions to fellow community members contributed to establishing a new sense of purpose and self-direction. Several participants described how the CDW program enabled them to assume roles as ‘ambassadors’ for oral health and community learning. In addition, their role as a CDW was characterized as a position that fostered a new sense of investment in the oral and overall health of their local communities. Participants like P4 described his role as an opportunity to serve and ‘give back’ to communities within Ifakara.

P4: “the training has been great, and one of the positive aspects is that I am a part of this community and there are things that I have learned during this process of training and

practicing within the community that have been very valuable to me and to my community members. And [that impact] has come through my oral health education sessions.”

CDWs also emphasized the importance of the oral health education sessions they provided as a powerful tool to mobilize and empower positive changes in oral health knowledge and behaviours within their communities of service. CDWs consistently described observed changes in the understanding and behaviours of mothers and parents within communities, particularly regarding oral hygiene care practices and the significance of dietary choices to oral health outcomes. As P4 shared,

“Education to mothers is particularly widespread in the neighbourhoods and communities we have been engaging with. Particularly on the usage of toothbrushes and making sure their kids are brushing their teeth well.. and education on sugar intake. Mothers now have an understanding of what products have sugar like drinks and candies and they are more aware of the contributors to tooth decay”

Another participant, P1 identified that within communities that were serviced by CDWs, community members similarly demonstrated increased awareness of the oral-systemic health link including the importance of their oral health status to their long-term health and well-being. This participant likened the positive uptake of oral health education by community members to other major public health and disease prevention successes.

“The education is widespread [within these communities]. It’s similar to how education was delivered on malaria and encouraging people to sleep under nets. With more oral health education, parents are more aware that if you don’t look after your oral health, it could cause other ailments in the future and it can affect other parts of the body or cause.. catastrophic loss of life for instance. And the base cause being that you didn’t take good care of your teeth”.

In addition to parents, CDWs also described ways in which they saw their oral health education sessions resonate with children, laying the foundations for good oral care habits and practices early on. The importance and significance of educating children within local schools and communities was a common narrative offered by focus group participants. As P2 shared,

P2: “one of the most positive aspects of engaging with the community is knowledge. Most of the kids in the communities where we are providing education.. they share their knowledge on oral health [with other children] and we have seen a change in their understanding. Most of the kids and their mothers now have an awareness of how to take care of teeth”

Participants in both focus groups also imparted the significance of program delivery for what they observed as widespread changes in health-seeking behaviours. New knowledge on oral health and understanding of its significance to overall health was identified as a catalyst for community members to begin taking charge of their oral health needs. Specifically, CDWs observed that community members showed an increased awareness of when to seek out professional oral healthcare in response to oral pain and discomfort. Moreover, CDWs described that many community members demonstrated an enhanced motivation to resolve oral issues and to be seen by an oral healthcare professional.

Challenges and Barriers to Transformative Change

In addition to describing the unequivocal benefits and positive impacts of the Oral Healthcare CDW Programme and educational delivery within communities, participants' narratives also highlighted significant challenges. Barriers to effecting transformative change for community members' oral health and appropriately addressing oral health disparities within the populace was a prominent topic of discussion. A major theme across focus groups was a lack of oral/health infrastructure and accessible services. While CDWs described being able to educate community members on oral health as an important prevention and disease detection resource, they described significant gaps translating needs identified within the community to actual provision of care. This was often characterized as an insurmountable barrier to getting community members the care they need after being identified by CDWs. Further, it was identified as a common source of frustration for both CDWs and community members themselves. As P1 shared,

P1: "As CDWs, we have to work within a certain scope of practice.. but it prevents you from being able to get that person what they need, even when you know what needs to be done. There's a disconnect and it's frustrating. You feel helpless because the information you provide is not really helpful and the individual is left in pain.. children are left in pain.. when you know that their tooth is decayed and it needs to be taken out by a professional."

Across focus groups, participants shared how community members faced additional barriers when they tried to seek out recommended/needed oral health care via hospital-services owing to cost as well as a lack of connection and referral systems between their community work and existing health services/other professionals. Many participants cited a lack of any consistent and accessible oral health care infrastructure and systems within the communities they were serving as detrimentally impacting community perceptions of the CDW program and its ability to produce sustainable and meaningful change. As P4 summarized,

“There’s no connection between this program and the hospitals or clinics. So, when I tell a community member to go to the hospital to seek care, they are starting from square one. When they get to the hospital there is no link between the program and the healthcare facilities, so this is a big problem. Because they are starting back at square one, and community members feel discouraged. It also doesn’t give our program a favourable view in the community because members feel frustrated.”

Other participants added to this discussion, adding that enabling program success and improving access to oral health care for communities in Ifakara needs to take a multi-tiered approach, including change that is initiated at the governmental level. P1 offered,

“The Ministry of Health needs to work closely with all other healthcare providers [and services] so that there is a link from us in the community to the final prescription provider, like the doctor”

Substantial barriers related to access to oral healthcare for community members was identified as having reverberating implications for CDW’s perceived value to their communities of service. Limitations on their scope of practice was identified across focus groups as an issue preventing CDWs from being able to enact ‘true’ change for oral health or to be recognized as a key contributor or partner in improving oral health outcomes.

P1: “we are contributing (to the community) but there’s a bigger issue of not being respected as a healthcare provider. We are part of that team- providing education and being a part of maintaining the health of the community but are not seen as healthcare providers or given that respect.”

Becoming Future Change Agents

Despite identified health systems challenges, focus group participants relayed a strong commitment and desire to see the Oral Health Programme and role of CDWs expanded to facilitate more targeted, intentional and meaningful service delivery to communities in Ifakara. Limitations on the reach of current program structure was a common theme within focus groups. As P2 shared,

P2: “The program works well but there should be changes in where we practice on a daily basis. I have been involved as a CDW for two years, but it seems like we are always going back to the

same locations.. and we know that there are other communities that are having similar challenges. So, the program is a bit restrictive in that we cannot get further into other communities, and we can't go serve those children."

Others described how CDWs could be utilized to a broader capacity and that they are well-positioned to be mobilized to remote communities that are largely underserved by the current health system. Mobilization of CDWs to remote and rural communities was identified by CDWs as a key area for program expansion that could begin addressing health inequities and may help to prevent and alleviate the burden of oral disease within these communities. As P4 shared:

P4: "We need to be considering areas that are not accessible by the current health care system and to include them. We need community health or dental workers to be able to provide oral and overall health education in those remote areas. If we aren't there to provide that education, they [those communities] don't receive any education at all".

In addition to expanding the reach of their oral health education sessions, participants also stressed the critical importance of expanding the availability of program-sponsored clinical oral healthcare services. The majority of participants spoke to this need in direct response to the positive impacts of the once-a-year free dental clinic that is a current arm of the program.

P1: "You know, the impact of this program has been mainly in Ifakara at the moment. There's a free dental clinic that happens here on a yearly basis over the past few years... and the people who benefit are the people here in Ifakara but not outside of Ifakara"

For P3, she emphasized how the provision of a free dental clinical once a year represented a critical component of the overall program, and directly threaded into the success of their work as CDWs and aims of improving oral health in Ifakara. As she explained,

P3: "The yearly free clinic has been very impactful and in how we do our work in the communities. Because we provide education.. and I at least know that at some point during the year there will be a free clinic coming up. It's a saviour for these community members. It's a good model in the interim until we establish proper services that are there for community members here in Ifakara and beyond. But that clinic gives community members hope... they got the education, they know what the issue is, and now there's a free clinic that they can go to and get that issue dealt with."

The outstanding need for “proper services” embedded within communities and which provide community members consistent access to oral health care professionals was a key point of discussion within focus groups surrounding program needs. It was also identified as a crucial but missing piece to support the current practice of CDWs.

P4: “There should be consideration of involving dentists in the program, even if it’s a pilot.. but including like a referral dentist. That way, if we find someone in the community (needing oral healthcare), we can tell them and then say to the community member- go see the dentist, they will look after your case and help you with next steps”

Within focus group discussions of program needs and health systems challenges, an overwhelming sentiment that emerged was a strong desire for CDWs to be provided opportunities to become what their communities need. Expanding CDWs scope of practice to enable them to address immediate oral issues and systemic sequelae was identified as a vital first-step to enhancing program delivery. As P1 explained,

P1: “if we are providing education, we should also have the opportunity to upgrade our education and training at a certain time, so that we can provide some first aid, some direct care and pain management to mitigate the immediate issue.”

In addition to scope of practice expansion, several participants expressed a firm interest in ‘upgrading’ their current education at the professional level. CDWs shared that the impact of the current program in improving oral health outcomes and adequately serving community needs could be better leveraged by an investment in advanced education for a CDW. Sponsored educational pathways for CDWs to become oral healthcare professionals situated permanently within communities was identified as a key strategy to build sustainable oral healthcare infrastructure and advance care within the wards of Ifakara.

P4: “if you can’t find or provide someone to fill this role [oral healthcare professional]... then we could be upgraded, and we could go and get more education and training. We could be a part of the healthcare system”

Conclusions

Observable success in changing knowledge, attitudes, oral health/dietary behaviours of community members across the wards serviced by the CDW program.

The findings of this evaluation have identified key successes of the Oral Health Education Programme and impacts on communities and community members' oral health within the 9 wards of Ifakara. The narratives shared by participants offer key examples of how CDW program delivery and oral health education sessions within communities contribute to observable changes in the knowledge and attitudes of community members towards oral health and disease prevention. CDWs provided positive perceptions of how their program delivery was received by members of the community and described ways in which education on oral health was spread both formally and informally throughout their communities of service. Education was identified as powerful tool that not only enhanced the oral health knowledge of community members but allowed CDWs trained under the Oral Health Programme to become a vital resource for oral health education, disease identification, as well as a potential access point for accessing care services within communities.

Observable success of education as a form of prevention and for enhancing health seeking-behaviours

In addition to enhanced oral health knowledge, participants also described positive behavioural changes that they have witnessed within communities in response to program delivery. Examples provided by the CWDs included observed changes in oral care habits and toothbrushing amongst adults and children, as well as improved dietary behaviours related to enhanced knowledge of sugar consumption and contributions to dental decay. Notably, focus group findings also revealed positive impacts of the CDW program for increasing community members' motivation to seek out oral and healthcare services to address identified needs, and as a form of prevention.

Broader challenges however related to lack of health/oral health infrastructure, no referral systems in place/links to existing health services and lacking adequate local oral health systems and providers

While our findings point to tangible successes of the CDW program for improving oral health knowledge attitudes, and behaviours within Ifakara, the experiences of participants also illuminate prevailing challenges to maximizing program potential and achieving transformative change for oral health. CDWs consistently identified that the extent of their program delivery and enhancing oral health outcomes for community members is often impaired by broader system challenges related to a lack of health and oral health infrastructure within the wards. A key point of concern raised by CDWs

included a lack of connection between their work within the communities and the ability to direct, and link individuals in need to appropriate health and oral healthcare services. Participants' narratives also alluded to the concerning frequency in which they have identified immediate oral care needs within communities, only to leave needs unmet owing to a lack of available services and limitations on CDW's scope of practice.

Recommendations

1. Confirmed program need and merit to program expansion. Inclusion of other wards/ mobilization of CDWs to remote/rural locations.

The findings of this programme evaluation confirm that there is both a need, and merit to expanding Provision Charitable Foundation's Oral Health Programme. This includes both geographic expansion to remote and rural communities presently not serviced by the CDW Programme, as well as the targeted and innovative expansion of care services to better meet the oral health needs of communities and achieving programme aims and goals.

2. Additional training for CDWs/scope of practice expansion for CDWs in oral health disease prevention modalities (i.e. fluoride varnish, application of silver diamine fluoride (SDF)).

A key recommendation to address immediate oral health needs in the public and enhance access to care across underserved communities includes additional training for CDWs and an expansion of their scope of practice. To effect transformative change for oral health across communities in rural Tanzania, now and in the future, it will be important to lobby decision makers for policy change at a national level. These recommendations are consistent with the World Health Organization's *Global Strategy and Action Plan on Oral Health 2023-2030*¹², which outlines the importance of enhancing and developing population-based public oral health measures that support oral disease prevention. Preventative treatments such as topical fluoride varnish and silver diamine fluoride (SDF) applications represent key examples of effective and evidence-based interventions that have been implemented successfully within public oral health programs and initiatives on a global scale.¹³⁻¹⁷ As per the WHO, topical fluoride modalities are considered "essential dental medicine"¹⁸ in addressing the very high burden of untreated dental caries worldwide. In addition to substantiated evidence of the success of topical fluoride and SDF for preventing and arresting the detrimental progression of dental decay, this form of treatment delivered within community-based programming is bolstered by its demonstrated safety, ease of application, cost effectiveness and ability to be administered by non-oral healthcare providers.^{17,19,20} Expansion of scope of practice and the provision of additional training

for CDWs in the delivery of intraoral prevention treatments stands as a strong recommendation to enhance oral health outcomes, in complement to existing educational programming.

3. Reallocation of program funding to create a sponsored education stream/pathway for a CDW to become trained as an oral healthcare professional.

In addition to expanding the scope of practice for CDWs, our findings strongly support establishing a sponsored educational pathway for an existing CDW to become an oral healthcare provider (i.e. dental therapist) to create sustainable and permanent oral health infrastructure within the wards. Not only does this recommendation directly support overarching Oral Health Programme aims/goals of improving oral health outcomes in Ifakara, but also stands to address concerns identified regarding a lack of referral systems, consistent access to oral healthcare providers, and the timely provision of oral health services to community members in need. There is sufficient interest and motivation amongst CDWs. Opportunities to advance their education and training to better serve community oral health needs was a major theme identified. Recommended as a model, and borrowing from the current structure of the CDW program, instead of a fee for service model, the selected sponsored individual would provide oral health care as a salaried employee of Provision Charitable Foundation. Only patients who had been referred via the CDWs would be eligible for care under this model. Such a model would require equipment and supplies. However, this should dovetail nicely with the existing programs initiatives (i.e., annual oral health clinic) which could provide a source of donated equipment and supplies, continuing education, and annual mentorship to the individual.

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Appendix A. Guided Interview Questions

Guided Interview Questions CDW Focus Groups

Introductory Statement:

Thank you all for joining me today to discuss your experiences working as a Community Dental Worker (CDW) as part of the Oral Healthcare Training Programme. The goal of today's session is to learn from you. We are interested to learn how you have perceived this program to date which may allow us to better understand how this program can be strengthened and developed further to better serve our local communities in Ifakara. This is a safe space for you to openly share your perceptions of the training you received under this program as well as your experiences delivering oral health education to community members through community home visits, community schools and reproductive community health (RCH) clinics. I have a set of questions prepared to help guide our discussion today, but I encourage you all to freely discuss and share your own experiences and ideas as they arise. Your participation today is completely voluntary, and you may excuse yourself from the discussion at any time. Sharing your personal experiences is incredibly valuable to the research team and any quotes or information you share during this session will be completely de-identified in any future reports or publications and your privacy will be maintained throughout. Are there any questions before we get started?

Question 1:

What are your perceptions about the training you received to become a CDW?

Potential prompts:

- Are there resources or materials you found helpful?
- Following training completion, did you feel prepared to deliver oral health education in your community?
- Looking back on your training, are there resources or information, you wish had been included?
- Do you have any suggestions for making the training more useful/clear for you/future CDWs?

Question 2:

What can you share about your experiences delivering oral health education in the community – including all of your community sites, such a home visits, schools and RCH clinics?

Potential prompts:

- Were there any challenges or barriers you encountered in delivering these sessions?
- How did you feel the oral health education sessions you provided in the community have been received by community members?
- Can you share any successes you perceived from delivering oral health education in the community?

Question 3:

From your own observations- did you feel that the oral health education you provided was impactful? Can you share some examples to support why your opinion?

Potential prompts:

- Did any community members return to ask additional questions/for more information?
- Are there any behavioural changes in individual's daily habits and practices you felt (or witnessed) were changed in response to the education you provided?

Question 4:

From your experiences- do you perceive that these sessions helped to improve oral health or healthy behaviours in your communities overall?

Potential prompts:

- If yes, please elaborate
- If no, what changes would you like to see to make this program more impactful for improving the community's oral health and understanding of oral health?

Question 5:

Please share anything else you would like to add or let the researchers know about your experiences as a CDW and program delivery in your communities.

Concluding statement:

Thank you all so much for agreeing to speak with me today and for sharing your experiences with this program.

Challenges and Barriers to Transformative Change

- Barriers to effecting transformative change for community members' oral health and appropriately addressing oral health disparities within the populace was a prominent topic of discussion. A major theme was a lack of oral/health infrastructure and accessible services.
- While CDWs described being able to educate community members on oral health as an important prevention and disease detection resource, they described significant gaps translating needs identified within the community to actual provision of care. This was identified as a common source of frustration for both CDWs and community members themselves.
- CDWs shared how community members faced additional barriers when they try to seek out recommended/needed oral health care via hospital-services owing to cost as well as a lack of connection and referral systems between their community work and existing health services/other professionals. This detrimentally impacted community perceptions of the program and leave community members feeling discouraged.
- CDWs described that enabling program success and improving access to oral health care for communities in Ifakara needs to take a multi-tiered approach, including change that is initiated at the governmental level.
- Limitations on their scope of practice was identified across focus groups as an issue preventing CDWs from being recognized as a key contributor or partner in improving oral health outcomes (not respected as a healthcare provider/given that status).

Becoming Future Change Agents

- Despite identified health systems challenges, CDWs relayed a strong commitment and desire to see the program and role of CDWs expanded to facilitate more targeted, intentional and meaningful service delivery to communities in Ifakara.
- Limitations on the reach of current program structure, and a need for geographical expansion to access remote and rural communities not currently being served was a key recommendation and identified need.
- CDWs described that they could be utilized to a broader capacity and that they are well-positioned to be mobilized to remote communities that are largely underserved by the current health system.
- CDWs also stressed the critical importance of expanding the availability of program-sponsored clinical oral healthcare services. The majority of participants spoke to this need in direct response to the positive impacts of the once-a-year free dental clinic that is a current arm of the program. CDWs identified that the free clinic was important to their own work but needs to be expanded and for there to be permanent services available.

- Expanding CDWs scope of practice to enable them to address immediate oral issues and systemic sequelae was identified as a vital first-step to enhancing program delivery.
- CDWs also expressed a firm interest in ‘upgrading’ their current education, including at the professional level. CDWs shared that the impact of the current program in improving oral health outcomes and adequately serving community needs could be leveraged by an investment in advanced education for a CDW.
- Sponsored educational pathways for CDWs to become oral healthcare professionals situated permanently within communities was identified as a key strategy to build sustainable oral healthcare infrastructure and advance care within the wards of Ifakara.