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Community Health Workers and the Management of Non-Communicable Diseases Among Rural Health Clinics in Limpopo Province, South Africa: A Pilot Study

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Abstract

South Africa's rise in non-communicable diseases (NCDs) and healthcare provider shortages have generated the need for community health workers (CHWs) in rural areas. However, roles and interactions with clinic staff are not well understood. Interviews with healthcare workers at community clinics in Limpopo Province revealed common themes, including resource scarcity, clinic-patient partnerships, management of NCDs, and collaboration between professionals. The data did not support CHW-physician interactions, necessitating further research to describe these practices and to evaluate CHWs' impact on patient outcomes. CHW involvement in rural clinics is essential to patient-clinic partnerships and may help close treatment gaps in resource-poor areas.

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Keywords

Cardiovascular Disease; Hypertension; Diabetes Mellitus; Rural Health; Community Health Workers

INTRODUCTION

Although the post-apartheid government of South Africa has yielded a more egalitarian nation, historical inequalities and marginalization of the poor have produced lasting racially, culturally, and economically separate communities. The healthcare sector reflects a remnant of the country's past economic and geographic stratification,¹ as a minority of the country's population receives almost half of the total healthcare spending, leaving an equal amount for the vast majority in the form of government-subsidized care.^{1,2} The effects of this inequality are especially visible in rural regions of the country, which suffer from increased poverty and poor access to healthcare compared to more developed regions due to historical segregations.^{1,3}

Though South Africa and other Sub-Saharan African countries have been largely known to have high rates of communicable diseases, there has been a recent rise in the prevalence of non-communicable diseases (NCDs). This includes cardiovascular disease as well as metabolic disorders, such as diabetes mellitus (DM), and associated risk factors of cardiovascular disease, such as obesity and hypertension (HTN).^{4,5} As recently as 2014, NCDs accounted for nearly half of all deaths in South Africa, and this problem is expected to worsen as the population ages.^{4,6–8}

Residents of rural and underdeveloped areas are most susceptible to NCDs as a result of cultural and social forces as well as inadequate government funding of rural health clinics, which, in addition to some genetic determinants, have had major impacts on the health of rural communities.^{1,2,5,9} For this reason, South Africa has recently begun a shift toward managing the growing concern for chronic NCDs and associated complications and risk factors.^{1,6,8,10,11} In 2010, 38.9% of all deaths in South Africa were due to NCDs, 44% of which were from cardiovascular disease and 8% from DM, marking a steady rise in these rates and reflecting that NCDs or associated complications were the leading causes of death in the country.⁹ As recently as 2014, South Africa had among the highest rates of HTN in the world, with greater prevalence in its rural areas.⁸

In addition to the increased burden of NCDs, the emigration of healthcare professionals (HCPs) – combined with HIV- and AIDS-related deaths – has produced severe shortages of physicians and nurses in South Africa.^{1,10} Given the country's low ratios of patients to medical practitioners,^{10,12,13} especially in the rural provinces, the South African Department of Health (DOH) has attempted to close this gap by shifting traditional nursing responsibilities to community health workers (CHWs). This shift, supported by the World Health organization and aimed at Millennium Development Goal achievements, especially in underserved areas, was intended to make healthcare more accessible and cost-effective. Secondarily, the introduction of CHWs sought to improve connections between health

clinics and their communities while demonstrating successful treatment compliance through physiological indicators (e.g., BMI and blood pressure).^{5,14}

Study Aims

CHWs are recognized as trusted members of the community with the ability to negotiate complex social networks as well as provide integral links between households and conventional healthcare settings.¹⁵ CHWs are expected to be knowledgeable about the management and prevention of diseases within their scope of practice,⁵ which may vary based on the region, specific needs of the community, or focus of the CHW.¹ There is currently a large body of evidence supporting the effective use of CHWs in underserved regions in a variety of health conditions.^{16–18} However, with the increased use of CHWs in the care of patients with NCDs, the CHW role, inter-professional collaboration, and the patient-clinic collaboration are not well understood. Thus, there is a growing need to describe their roles and collaboration with other HCPs as we refine and evaluate CHW-delivered interventions related to the management of NCDs.^{10,16,19}

This study builds on the findings of previous research and education projects conducted by a tripartite collaboration among the University of Virginia (UVA) in the United States, the University of Venda (UNIVEN) in the Vhembe District of Limpopo Province, and the South African DOH. Beginning in 2001, these collaborative projects sought to create, implement, and evaluate a CHW training program on various health topics (e.g., asthma, motivational interviewing, and reading medication labels), chosen in consultation with the DOH.²⁰ The program demonstrated high interest and approval ratings in terms of enhanced competence and confidence in CHWs' ability to engage with patients as well as satisfaction with the program.^{3,21,22} and has continued based on the educational needs of CHWs regarding NCDs and related risk factors.

The aim of the current study was to describe inter-professional collaborative clinical practices of the CHWs in the management of NCDs, specifically DM and HTN, in nurse-led community clinics in Limpopo Province, South Africa.

METHODS

Setting

The study was conducted in the Vhembe district of Limpopo Province, the northernmost Province in South Africa. Limpopo Province, with a population of approximately 5.6 million citizens and approximately 10% of the country's total population,²³ is one of the poorest provinces in the country. This region is characterized by high rates of unemployment, inconsistent access to water, and limited access to healthcare of any kind.³ In the Vhembe District, nearly one-third of CHW services are dedicated to DM and HTN services.¹⁵

Traditionally, the community-based clinics serving this area were primarily nurse-run. Physicians made regular visits between clinics but were not present every day. Nurses were also supplemented by other members of the inter-professional team, such as pharmacists and dietitians, with varying regularity. The tendency for nurses to run the clinics and make

treatment decisions was therefore an important contributor to the need for CHWs, as nurses no longer made regular home visits in the community.

Ethical Considerations

We obtained approval for all study protocols and documents, including consent forms and interview guides, from the UVA Institutional Review Board for the Social and Behavioral Sciences (#2015-0152-00). Prior to each interview, all participants were provided a paper copy of the informed consent, which was read aloud prior to obtaining a signature. When necessary, the consent agreement was also translated during reading of the consent form by a native student translator from UNIVEN.

All interviews were conducted in a private space to ensure confidentiality, and participants were asked to maintain the confidentiality of interview contents after their involvement once the study had concluded. While all health professionals, including CHWs, are trained and communicate in English, the presence of a translator throughout the consent and interview process was nevertheless used in order to provide participants with enhanced understanding and to contribute to the comfort level of participants.

Participant Selection

A qualitative analytic approach was employed. Forty-six HCPs (27 CHWs, 16 professional nurses, and HCPs from the disciplines of pharmacy, nutrition, and medicine) from the community clinics were recruited using convenience sampling and assigned to interview groups based on profession.

A key informant design allowed broader understanding of NCD management in this region. Focus groups were used, except in cases when there were not sufficient numbers to create a group. In these few cases, participants were interviewed individually.

Data Collection

Individual and focus group interviews were conducted at two community clinics within Limpopo Province. A semi-structured interview guide was developed using the findings of previous UVA-UNIVEN projects^{3,22} and informed by expert clinical knowledge. Participants were asked open-ended questions concerning their roles within the healthcare system, their scope of practice, current understanding of DM and HTN, interventions or modalities used by them in managing the care of the patient with DM or HTN, and the current collaborative relationships among members of the healthcare team. While topics in the interview guides were consistent between interviews, certain questions were adjusted to correspond to the specific role and scope of practice of the professional being interviewed. For example, the physician and pharmacist interviewees were asked specifically about prescribing procedures in these clinics, while CHWs were interviewed about practices related to home-based care.

Individual interviews consisted of at least one facilitator and one field note taker. During larger focus groups, more than one researcher acted in this role. Whenever necessary, at least one UNIVEN student was present to translate English to the local languages, *TshiVenda* or

XiTsonga, during the interview to aid in discussion. Each interview was audio-recorded with participants' permission and lasted approximately 60 to 90 minutes.

Audio files of focus group interviews requiring translation (CHWs and nurses) were translated and transcribed by a professional translation team at UNIVEN. The transcriptionists did not have access to any identifying information. Audio recordings of interviews conducted entirely in English (nutrition, pharmacy, and medicine interviews) were independently transcribed and verified by two researchers to ensure accuracy. Field notes were also transcribed for use in data analysis and to compare with interview transcriptions.

Using responses to questions asking inter-professional collaboration, including other HCPs of different disciplines, sociogram mapping provided an additional visual representation of the existing lines of communication within the clinics and was used to describe and interpret current inter-professional relationships between HCPs. Sociogram mapping also allowed the authors to find any existing gaps in communication or collaboration between HCPs.

Analytic Approach

We followed Braun and Clarke's¹ six-phase process of thematic analysis: (1) familiarizing oneself with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report.

RESULTS

Thematic Analysis

Analysis of participant interviews revealed common themes between the groups related to the management of DM and HTN. The themes identified were resource scarcity, the aspects of disease management and self-management, the importance of collaboration between HCPs (in particular between the CHWs and others), and the clinic-patient partnership.

Resource scarcity—Above all, participants commonly identified resource scarcity as a primary challenge to providing quality care to patients. The scarcity of material resources, such as medications, blood glucose test strips, and glucometers, was the most common concern:

We have a difficulty because... [supplies do] not come every time. It comes maybe twice in a month, so you find that the people who suffer from high blood [pressure] and these issues of sugar diabetes, [the blood glucose levels] have risen ...We are unable to check, and he does not have the machine. – CHW

One major consequence of resource scarcity was the patients' perceptions of the ability of clinic staff to provide care. This ultimately results in a loss of faith in the HCPs' ability to help patients:

So they just lose hope and say, "Let me not go to the hospital," and then it makes them default in treatment...It does not seem consistent to them, so they think, "The

clinic doesn't have these resources, so why would I be coming and taking my treatment?" – Nurse

Not only may this lack of medications and other resources lead to a loss of hope for medication availability, but patients also felt as though HCPs had these resources in their possession but were failing to distribute them to the community. This perception also may cause hostility toward HCPs, as seen by the CHWs traveling to their patients' homes:

When [medication] runs out, the community feels as if you are withholding the treatment from them. Sometimes they chase you away saying that you should no longer come because you do not come with the treatment. – Nurse

The lack of material and personnel resources available at these rural clinics, which resulted in mistrust of HCPs at the clinics and in the communities, may have been the reason for the emergence of behaviors that have been noted within the theme of disease self-management as a supplement to medications.

Self-management of disease—Although one interview question referred to management of NCDs – specifically of DM and HTN – in these rural clinics, a more specific theme emerged from the data sets. The concept of disease self-management through lifestyle alteration was as heavily stressed as, if not more so than, medical management of NCDs. As a result, good health behaviors were emphasized by multiple HCPs when educating the patient:

I go into...more details, when it comes to food so that whenever I say, "Don't do this," they understand why they're not supposed to do that, so it's their choice... That's why sometimes, when they come for a second visit, they find that maybe the blood glucose is still high...but I explain thoroughly what's going on. – Nutritionist

Actually, even before doing that [medical management], you're supposed to have dietary interventions. You're supposed to advise the patient on lifestyle modification. Patients should exercise, change their diet, change their lifestyle, change their smoking, all those. So then, only after that you give the drug management. – Physician

Changes in health-related behaviors, as well as medication adherence, are both a main goal of care and a major challenge to a majority of the groups interviewed:

The hardest part is that patients don't adhere to their drugs...So they are diagnosed, they are prescribed medication, but they don't adhere due to various reasons. So you find that the disease is not brought under control just because the patient is not taking their drugs every day because it's a chronic medication. – Physician

Once again, it is possible that this lack of adherence to medication regimens may be due to the lack of consistency with which medications are available to patients. Health-related behaviors become more important as a method of managing chronic NCDs in these rural communities.

Collaboration between providers—In order to assess the current patterns of collaboration between members of the healthcare team, all interviewees were asked how

they work with other HCPs at the clinics. As a whole, there is a culture of collaboration among HCPs, especially between nurses, pharmacists, and nutritionists. As one nurse recalled: “Let’s say there is [a] patient. Sometimes he does not comply well with the treatment...Then that is where we send them to the [nutritionist] so that he could talk to them about their diet, what they should eat or what not to eat.”

We also observed a strong culture of teamwork between medicine and other specialties, such as physicians’ use of the clinic pharmacy services to adjust medications when needed:

We are lucky to have a pharmacist...We work very well with him. If he sometimes would refer patients to me, if patients are complaining of side effects, if they want to switch a drug, they are not taking their pills for various reasons, he also refers patients to me. – Physician

In addition to nurses sending patients to a nutritionist or pharmacist for referrals, these individuals also offer their services to nurses and their patients when they observe a need for those HCPs to become involved:

If maybe I feel like this patient needs further assistance, I will refer to the doctor... Because I go much deep with the social history, if maybe there’s some challenges...I go to the social work...and then they will get assistance...I have a good relationship with them. – Nutritionist

Though not all HCPs interact directly with one another (for example, nutritionists may not speak directly to pharmacists), the network between HCPs within the clinic ensures that the proper team members are involved with patient care. The largest gap in interaction between members of the healthcare team appears to exist between physicians and CHWs, as seen by sociogram mapping and interview data:

I have not personally worked with [the CHWs], but I know they are available. For example, if I have a patient who is diabetic [and] has not come for follow-up... [the CHWs] go to follow-up to see: is the patient still there, have they relocated, are they still alive, why have they not come back to the hospital? – Physician

Clinic-patient partnership—In addition to inter-professional communication in the clinic, CHWs are similarly able to maintain the lines of communication between the clinic staff and patients in the community. CHWs do so by making frequent, often daily, visits to the patients’ homes and by referring patients to the clinic whenever necessary:

If [the CHWs] encounter someone in the homes [who is] having problems, they have... printed papers where they have to fill for referral, and when they come to the clinic, they will have to give them this paper, and they will get all the help, and when they come back to the clinic...they give feedback and they will say, “[we] have referred the patient to the clinic or hospital.” – CHW

Therefore, the most common communication between CHWs and other HCPs comes in the form of referrals to the clinic or hospital and CHWs’ encouragement of patients to return to the clinic for follow-up care. This is a result of the CHW role in home-based care of ensuring that patients follow up with the clinic HCPs. The theme of inter-professional

collaboration is apparent in this theme of the clinic-patient partnership as well, as the clinic is most effective when patients are referred to the proper service.

DISCUSSION

The data collected from the focus groups and key informant interviews provide insight into the organizational structure within the clinic as well as between the clinic and the patient. The data also reveal four themes – resources, inter-professional collaboration, clinic-patient partnership, and self-management of disease – that appear across data sets of different HCP groups.

Medication adherence, as well as behavior and lifestyle alteration, remain an issue, as they were identified by HCPs from multiple professions as a major challenge to disease management. One possible explanation for the large emphasis on lifestyle changes compared to medical management of disease may be the limited resources available at these clinics and the HCPs' desires to help patients manage their diseases in ways that are more sustainable in the communities. This may itself be a challenge, however, with the combination of learned behavior and limited access to healthier foods.⁴

Sociogram mapping was a useful tool when evaluating the themes of both inter-professionalism and the clinic-patient partnership. CHWs have extensive patient contact and are an essential link between patients and other HCPs, as they interact with nurses, nutritionists, and pharmacists. Given this information, additional research is indicated to evaluate both the impact of CHWs as an avenue of communication between the clinic and patients in the community and the effectiveness of CHW involvement in producing better patient outcomes.

At the time of data collection, it was found during the process of a physician interview that the South African government had recently begun an initiative within the DOH which aimed to place both a physician and a pharmacist in each community clinic. This program was currently being piloted in the Vhembe District before being introduced into other areas of the county. As a result, neither the physician nor pharmacist interviewees had had much opportunity for interactions with CHWs or other HCPs at the time of the study interviews.

In the absence of pharmacists or physicians, as is common in many of the rural community health clinics, nurses are given the autonomy to diagnose certain conditions and prescribe a limited set and dosage of medications. We observed a strong level of communication between nurses and CHWs. This is encouraging, as the current standard of practice in community health clinics is that these sites are most commonly run by professional nurses.

With regards to communication and collaboration, improved communication between physicians and CHWs in the future may prove beneficial for patient care, should this initiative continue. One physician revealed that while being aware of the CHWs' presence in the communities and clinics, he was not knowledgeable about the specifics of their scope of practice and responsibilities surrounding patient care and education. This physician interview revealed a desire for increased knowledge about the roles and responsibilities of CHWs in order to facilitate the ability to request specific interventions by the CHWs. There

is widespread evidence that CHWs are cost-effective and capable of delivering basic home-based care services in vulnerable communities while strengthening relationships between communities and health systems.^{14,16–19,25} Future CHW training that is in line with clinic and community needs may also become more efficient and relevant to patient care priorities if greater teamwork between physicians and CHWs is achieved.

An additional area for improved communication may exist between nurses and nutritionists. This improvement may come from nurses' increased knowledge about the role of nutrition services, given the heightened importance of lifestyle alteration in this region. According to the staff nurses interviewed, approximately 30 patients come to the clinic for treatment of DM or HTN each week; however, no more than six of these patients are seen by a nutritionist.

Lastly, the theme of self-management of disease and its importance in these community clinics is very closely related to the scarcity of resources, as mentioned above. Again, the reported lack of medication adherence may be due to a lack of resources and may also be worsened by community members' loss of trust in HCPs to provide these resources. These findings regarding resources and the challenges of rejection from the community are consistent with previous findings.¹⁵ Emphasis on self-management, therefore, will likely remain as one potential bridge between CHWs and the community with regards to building and maintaining trust between patients in the setting of limited medication resources. The addition of physicians to community clinics in the future may also help to alleviate this pressure. Patients in need of a physician consultation previously were required to visit a larger hospital. Therefore, in the future, additional resources may also be routed to the community clinics with an in-house physician.

Similarly, the addition of pharmacists to the inter-professional team is expected to grow, as is their collaboration with other HCPs, including nurses and CHWs. Past collaboration initiatives between UVA, UNIVEN, and the South African DOH have focused on the provision of enhanced CHW knowledge about DM and HTN. This has included topics on pharmacy literacy, such as medication safety guidelines (safe storage and handling) and reading pharmacy labels. Past teams have found high levels of CHW satisfaction with these programs, and this desire for additional pharmacy-related knowledge may be a platform on which to establish further knowledge exchanges between pharmacists and CHWs in the future.³

Study Limitations

As this was a pilot study, it was only through this qualitative analytic approach that we were able to identify initial themes considered important by those providing care to patients. In addition, the inability to interview focus groups during follow-up interviews may be limiting to clarity and detail.

In addition, the study was limited by not achieving thematic saturation and by the inability to repeat focus groups for clarity and detail of responses. This was a result of both a time restriction and a limitation of the number of HCPs available to be interviewed, as clinics in the area are small and widely separated geographically. Future research should also seek to

obtain baseline patient data regarding care provision, resource availability, relationships among providers and between providers and patients, and self-care management, as these data can provide the foundation for assessment tools for future research studies and interventions.

A final limitation of this study was the nature of data collection and interpretation within the context of Western culture and medicine. Although clinics and hospitals in South Africa subscribe to Western medical practices alongside traditional medicine, clinics, especially those which utilize CHWs in rural communities, operate within the context of community participation and relationships. This is demonstrated by the concept of Ubuntu, translated loosely as “I am because we all are,” and is deeply rooted in South African culture.²⁶ Therefore, when considering the ideal inter-professional networks and collaborations in clinics, the concept of Ubuntu has been used as the foundation for such a model. Although no true proposal of clinic structures should be finalized without the direct input from clinic HCPs, Figure 2 offers a proposed structure, which relies on each group of HCPs as well as incorporates the patient and family more fully into health and the management of disease.

CONCLUSION

This qualitative study provides novel insights into the experiences and perspectives of providing healthcare in rural clinics in Limpopo Province. They support the necessity of collaboration between HCPs in rural clinics of South Africa and the importance of CHW involvement, knowledge, and training, which may help close gaps in patient care and disease management by encouraging adherence to treatment regimens and more frequent clinic visits when necessary. Comparison between interviews reveals that one major challenge to providing quality patient care in this area is the scarcity of clinic resources, including personnel, knowledge, and materials.

The priorities and methods of disease management in these areas differ from medical management in metropolitan health systems because of the limited material and personnel resources available at these rural clinics. These findings provide insight into the management of rural health clinics in similar developing countries and patient populations. The need for further research into the mechanisms and sustainability of CHW involvement and training has been well-established, especially as CHWs become more common in developing countries. However, we also suggest a need for further research focused on the effect of CHWs on the management of care and clinical outcomes for patients with NCDs.

Answers obtained from this qualitative study may pave the way for more in-depth quantitative studies in the future in order to explore the impact of CHW interventions on patient outcomes. This enhanced knowledge, combined with improved CHW interventions in the future, offers the potential for the advancement of treatment options in communities with known risks related to cardiovascular health that are low in resources.

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APPENDIX A: TABLE AND FIGURE LEGENDS

Figure 1. Sociogram Mapping of Inter-Professional Communication. Current Communication Links Among Healthcare Professionals (Solid Line), and Lack of Communication Between CHWs and Physicians (Dashed Line).

Figure 2.

Unbuntu is a philosophy of life embraced in countries in the southern part of the African continent that drives collaboration. Within their scope of practice, each HCP makes an equal contribution to patient care outcomes. The patient and family, as well as the CHW, have a seat at the table with the other members of the inter-professional team.

Table 1

Sample Interview Questions

Area of interest	Sample question
Scope of practice and description of roles	“What is your role as a home-based care worker?”
	“What is expected of you as a home-based care worker?”
	“What does a typical home visit look like?”
	“Tell me about your role in managing diabetes and hypertension patients.”
Knowledge questions	“How would you define diabetes?”
	“How would you define hypertension?”
Description of current disease management	“What kind of advice do you regularly give to a diabetes or hypertension patient?”
	“What resources are available to you to help you give good care?”
	“What role do your patients have in receiving good care?”
	“Can you tell me about a time when you gave a diabetes or hypertension patient good care?”

Area of interest	Sample question
	“What are your goals with your diabetes and hypertension patients?”
Collaborative interactions	“How do you work with other members of the healthcare team?”

Table 2

Thematic Analysis: Definitions and Examples of Themes

Theme	Definition	Example
Resources	Materials, aid, or other assets for the management of disease	“There is nothing we can do. At times you find that it is hyperglycemia; we do not know. There is no instrument to diagnose with...in such a case we do not know which direction to take.” – Nurse
Collaboration between HCPs	The involvement with and communication between multiple health disciplines in forming a disease management plan for patients	“Let’s say there is a patient; sometimes he does not comply well with the treatment... then that is where we send them to the [nutritionist] so that he could talk to them.” – Nurse
Clinic-patient partnership	The clinic’s involvement of the patient in his or her own care	“So when we arrive, we are able to talk to them and tell them that they should come to the clinic so that they are able to see the doctors and nurses so that they are able to get the treatment and take them.” – CHW
Self-management of disease	The patient’s role in the alteration of habits, seeking treatment, and following health-related advice in regards to managing his or her own disease	“It’s when the patient do[es] not...adhere to treatment...Most of them, they do follow...It changes what they eat, what they do, manage their personal life. It’s very difficult to manage that.” – Pharmacist

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