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Strengthening community actions to improve diabetes mellitus care optimising public health facilitators

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Abstract

Background Diabetes mellitus is the second leading cause of death in South Africa, and almost 90,000 people died from diabetes-related causes in the year 2019. This study aimed to investigate facilitators that can be harnessed to strengthen community actions and barriers that should be redressed in structured public health and health promotion programs for people with diabetes mellitus at a primary healthcare level.

Methods An exploratory qualitative study was conducted using face-to-face interviews among 20 conveniently sampled participants. The Ottawa Charter was adopted to guide health promotion and strengthening actions for people with diabetes mellitus. This study was conducted at Ngangelizwe Community Health Centre. Ngangelizwe is one of the townships located about 2 km east of Mthatha Town in the Eastern Cape Province of South Africa. The thematic analysis method was used to analyse data with the assistance of Atlas ti, version 23 software.

Results Five overarching themes were yielded and categorized as facilitators and barriers. Facilitators included enhancing the role of community healthcare workers and strengthening health education activities. Barriers included lack of support groups, food insecurity, and unavailability of community health promotion programs.

Conclusion We conclude that a collaborative health promotion intervention with the necessary competencies should be designed to assess needs and develop, implement, and evaluate relevant empowerment programs at the household and community levels. This approach involves active engagement with health promoters/ public health practitioners and community health workers at the local level, allowing individuals and communities to access motivation and knowledge regarding the control of diabetes mellitus.

Keywords Diabetes mellitus, Facilitators, Barriers, Strengthening, Community actions, Health promotion

Background

There are approximately 4.6 million South African adults living with diabetes mellitus, of which about half of them remain undiagnosed [1, 2]. In South Africa, diabetes mellitus is the second leading cause of death after tuberculosis, and in 2019, almost 90,000 South Africans died from diabetes mellitus-related causes [1, 3, 4]. In Africa, the number of people living with diabetes mellitus is approximately 19 million, mainly affecting the aging population. The surge in diabetes cases on the continent has been attributed to increasing urbanization, declining dietary standards, and less physical activity. The affected people are expected to grow to more than 40 million by 2045 [1, 5]. South Africa has one of the highest prevalence rates of diabetes mellitus in sub-Saharan Africa. The severe threat is that poorly managed diabetes

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mellitus leads to serious complications, disability, poor quality of life, and early death [1, 6].

Consequently, diabetes mellitus requires extensive self-management regarding diet, physical activity, and medication to prevent disease complications at a primary health care (PHC) level [1]. Health promotion programs motivate self-management activities and are critical in preventing diabetes mellitus for vulnerable people. The successful self-management of diet, exercise, medications, and insulin doses demands high health literacy and numeracy levels and a comprehensive empowerment approach [6]. Diabetes mellitus is recognized as a syndrome, a collection of disorders with hyperglycemia and glucose intolerance as their hallmark, due either to insulin deficiency, impaired effectiveness of insulin's action, or a combination of these [7, 8]. The empowerment approach for people with low incomes and the illiterate is mainly at a PHC level, in the form of health advocacy, enablement, and mediation at the community level [9, 10]. Clinicians often advise behavioural change, interpret blood glucose trends, and adjust medication doses within brief clinic visits, sometimes engaging with patients who may have a limited understanding of their condition or treatment plan [1, 11]. However, behavioural, lifestyle change, and sustainable community actions are beyond the practice scope of clinicians. Lifestyle change requires a combination of achievable daily activities involving individuals, groups, and communities in the form of organized health promotion programs for powerless populations [9, 12, 13].

Despite the high demand for health promotion programs, an audit identified that well-structured programs composed of needs assessment studies before intervention against diabetes mellitus are less resourced in South Africa [6]. The needs of people with diabetes include patient empowerment, regular diabetes check-ups, monitoring of blood glucose levels, and access to medications [6, 9, 12]. The most common, well-resourced providers among healthcare professionals at the PHC level are clinicians like physicians, nurses, and dietitians. Qualified health promoters (non-clinicians) are the only healthcare workers not registered as professionals among healthcare providers in South Africa [6].

According to Abdelhafiz et al. [14], diabetes mellitus is an exceedingly prevalent metabolic condition in aging societies associated with high levels of morbidity, costly multiple therapies, and functional deterioration that challenge even the best of healthcare systems to deliver high-quality and individualized care. Patient safety is a priority issue for managing older people with diabetes mellitus. Still, it is often compromised by inappropriate treatment choices, suboptimal specialist follow-ups, and patient-centered matters, such as the development of cognitive dysfunction or depressive illness [14]. However, profound structural aspects of culture, including individual, group, and community needs assessment, proper planning, implementation, and evaluation of health promotion interventions, are rarely addressed [15, 16]. Therefore, the purpose of this study was to investigate facilitators in strengthening community actions and barriers that should be redressed in structured health promotion programs for people living with diabetes mellitus at a community level, premised on the tenets of the Ottawa Charter as shown in Fig. 1, based on the qualitative reporting guideline of O'Brien et al. [15].

Methods

This study adopted a qualitative approach utilizing an exploratory research design. Semi-structured, face-to-face interviews were conducted with 20 people with diabetes mellitus [17, 18]. This research applied the strengthening community actions, one of the five key action areas of the Ottawa Charter, to structure the interview questions for guidance (Fig. 1). Other areas of the Ottawa Charter include building healthy public policy, creating supportive environments, developing personal skills, and reorienting healthcare services [9, 19].

Researcher characteristics and reflexivity

The research team comprised a postgraduate student (ON), the principal investigator, and two experienced qualitative researchers with doctoral degrees in public health (M.D. and E.M.) as project supervisors. To ensure that our beliefs, assumptions, and biases did not significantly influence the research process, we ensured that we were not much swayed by the challenges (both health-wise and economically) faced by our participants to influence our lines of questioning and interpretation of results.

Setting

This study was conducted at Ngangelizwe Community Health Centre, Ngangelizwe. Ngangelizwe is a township about 2 km east of Mthatha's central business district. Mthatha town is in Oliver Reginald (OR) Tambo region, one of the six regions in the Eastern Cape Province of South Africa. Settlement in Ngangelizwe started in the 1930s, and the township is considered a historical part of the King Dalindyebo Municipality in the OR Tambo Region. Ngangelizwe is estimated to have a population of 70,000, occupying 12,600 households primarily within formal housing and some informal settlement areas. Most of the population at Ngangelizwe (99%) are Black South Africans [20].

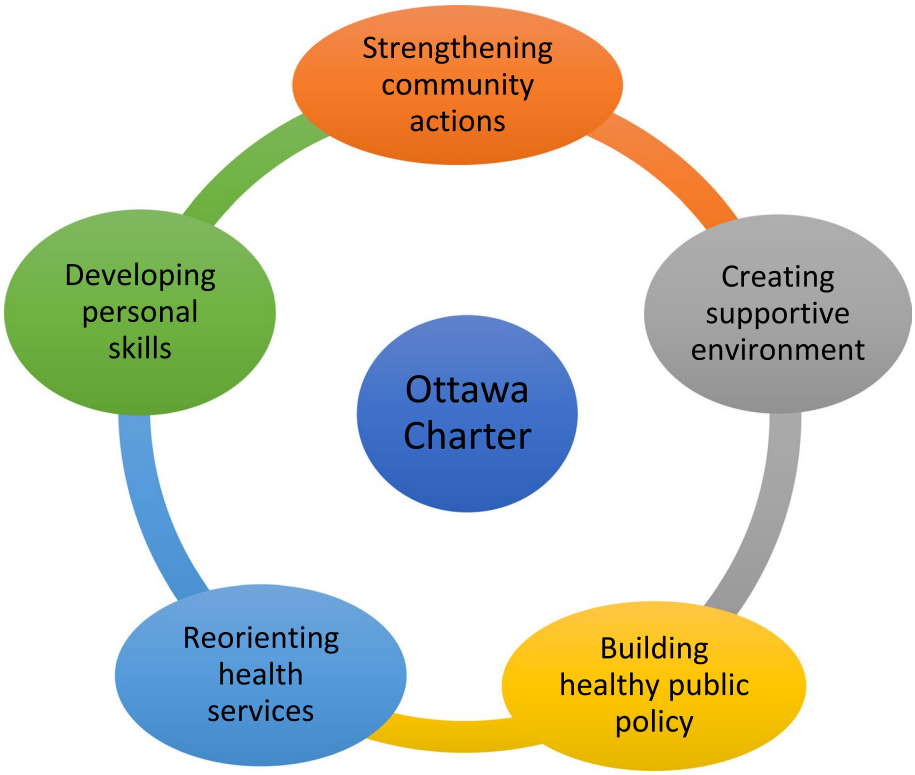

Fig. 1 The Ottawa Charter for health promotion (WHO, 1986) [9]

Participants' characteristics

The study population in this study were clients with controlled diabetes mellitus and between the ages of 30–60 years living in Ngangelizwe Township, Mthatha, and had been on treatment at the Ngangelizwe Community Clinic for at least one year. The participants comprised 16 females and four male Black South Africans, as shown in Table 1.

Sampling strategy

A non-probability convenience sampling [17] was used to select 20 participants for the study (Table 1). The nurse in charge of the diabetic clinic assisted in selecting participants who had been on diabetic treatment for at least one year. This was so as we were only interested in participants who were on diabetes treatment at the facility.

Table 1 Characteristics of participants ($n = 20$)

Variable	Characteristic	Frequency
Gender	Females	16
	Males	4
Age category	30–40 years	2
	41–50 years	7
	51- 60 years	11
Race	African	20
	White	0
	Coloured	0
	Indian	0

Data collection tool and procedure

Individual face-to-face interviews were conducted in English and IsiXhosa home language by the Principal Investigator [O.N]. Data was collected using a semi-structured interview guide; a digital voice recorder was used to record interviews [21]. This allowed the participants to express themselves freely without prejudice and allowed the interviewer to further probe for clarity. Open-ended questions were asked in the interviews, and observations were noted down simultaneously.

What are the needs of people living with diabetes mellitus in your community? What are the facilitators and barriers to lifestyle and behavioural change related to diabetes mellitus? Each interview lasted 30 to 45 min to provide understanding and experiences of out-patients living with diabetes mellitus at Ngangelizwe Health Centre. Data saturation was reached at participant number 20, and it was unnecessary to continue collecting data.

Data processing and analysis

Interviews were first translated from the IsiXhosa language into English by a professional language translator from the Language Department at Walter Sisulu University. Transcripts were translated verbatim to reflect the views of participants. The collected data were then uploaded into the ATLAS ti (version 23) software for analysis. Data were analysed and presented utilizing the thematic analysis method, which emphasizes examining, pinpointing, and recording patterns within the data [21].

The three researchers of this study analysed the data. A six-phase process was used to enable data organization, which included (a) familiarization with the data, (b) generating initial codes, (c) searching for themes among codes, (d) reviewing the themes, (e) naming themes, and (f) producing the final report [22]. This software allowed for the coding and analysis of large amounts of qualitative data and helped to identify themes and patterns in the data. This analysis enabled us to clarify the participants' experiences and perspectives on the topic of interest (Table 2).

Trustworthiness of findings

Validity and reliability

Two peer researchers were requested to check the transcripts of the collected data with clear written instructions to ensure validity and reliability, as suggested by some researchers [23, 24]. They also categorized and developed themes from the data. Categories and themes were compared with those identified by the primary researchers in line with Polit and Beck's recommendation [25]. The researchers constantly maintained alertness against bias by opposing personal opinions against the collected data. Similar themes were adopted, and the codes were re-examined, regrouped, and given new names [23].

Dependability, credibility, and confirmability

The study used Guba's [26] model of trustworthiness to ensure the appropriateness of inquiry through dependability. Dependability was established through an audit trail, in which a detailed record was kept in all data collection and analysis procedures. This allowed for the replication of the study and the verification of its methodological rigor. There was consistency of analysis throughout the time taken by the primary and peer researchers. The analysis techniques all of which rest on credibility and confirmability.

Credibility was established through triangulation, where multiple data collected were used to corroborate the themes and interpretations. This included data collection methods (interviews and observations) and researchers. To establish the confirmability of the study, an audit trail was kept of all decisions made during data collection and analysis. The whole process allowed for the transparency and objectivity of the study. All modifications to the study design were also conducted, as suggested by Lincoln & Guba [26].

Results

The data analysis yielded five overarching themes categorized as facilitators and barriers. Facilitators included enhancing the role of community healthcare workers and strengthening health promotion activities. Barriers identified in the study included a lack of support groups, food insecurity, and the unavailability of community health promotion programs. Table 2 shows the summary of thematic results that were analyzed from the data.

Enhancing the role of community healthcare workers

A community health worker (CHW) mediates between the community and the healthcare facility, government, and social service systems. CHWs are on the front lines, providing advocacy, mediation, and support to civilians to help them improve their lifestyles and connect them with their proper healthcare options. The participants complained about not getting the full support they needed from CHWs regarding their health condition. They want CHWs to regularly check up on them concerning their treatment and lifestyle changes. Reorienting healthcare services of the Ottawa Charter encourages other sectors to play their roles in supporting self-help in the communities. It is an essential activity in the empowerment action of diabetic patients regarding behavioural change and lifestyle. Behavioural change and lifestyle modification is an enabling process that demands collaborative activities with other relevant stakeholders.

> *Community healthcare workers should visit homes with diabetic patients regularly and check how they can help them. [Participant #3]*

> *The community workers who do follow-ups should be motivated to check if patients still have their pills. Also, check if they go to the clinic on their appointment dates and get all their medication from the clinic. [Participant #1]*

> *Community healthcare workers and non-governmental organizations [NGOs] no longer come to check on us at our homes; they must do it regularly because we are old, so we forget to take our medication. [Participant #6]*

Table 2 Categories, themes, and quotes

Categories	Themes	Quotes
Facilitators	Enhancing the role of community healthcare workers	Community healthcare workers and community-based carers (NGOs) are no longer visiting us to check if we are well at home. [Participant #3] Community healthcare workers should check us at homes and see how they can help. [Participant #3] The community workers who do follow-ups should be motivated to check if patients still have treatment and verify if they are collecting their tablets from the clinic. Also, to check if they visit the clinic on their appointment dates. [Participant #1] Community healthcare workers no longer come to check on us at our homes; they should do it always because we are old and forget to take our medication. [Participant #6]
	Strengthening of health promotion activities	Dietary coaching and collecting of tablets are activities that often need encouragement. We sometimes eat our maize porridge and forget to take our treatment. [Participant #3] We need to be educated about the disease because we don't know it very well; the nurse will tell you that you have diabetes, eat this and not eat that, and here are the pills, but do not go into detail about how to gain the power to control the disease. [Participant #5] We must be advised more about the disease and how to live with it. Diabetes is a severe disease; doctors amputated the leg of my friend because of this disease [Participant #6] People with diabetes mellitus need more than health education on how to live with it. Also, to receive support from society with challenges related to diabetes. [Participant #15] We should have health promotion events where people will be made aware of the disease and be given sufficient information on how to take care of themselves. [Participant #20]
Barriers	Lack of support groups	If there can be a place where we come together as diabetic patients and be well equipped on how to behave and what to eat at home. [Participant #4] There must be a place where we can meet and do physical activities as advised on TV. It does not happen when you are alone. I often see old ladies playing football on TV in other places or any other sport, but we do not have such activities here at Ngangelizwe. [Participant #5] Having support groups in our community will encourage people to take their treatment well and not default. [Participant #12] By having support groups for people living with diabetes, we will be able to discuss the challenges we are facing. [Participant #13] The availability of support groups in the community can encourage people to adhere to their treatment and practice healthy lifestyles. [Participant #17]
	Food insecurity	We can't even plant vegetables; the government can assist with fencing our small gardens. [Participant # 3] The most common challenge is high food prices in the marketplace, the same food we are recommended to consume. We usually buy maize meal, the only food we can afford. [Participant #5] Some older adults live with their grandchildren and are expected to buy enough food for everyone. We can't even buy what the healthcare workers encourage us to eat. Some older adults have arthritis and can't walk or do bodily exercises. [Participant #7] We cannot meet our needs and buy healthy food to support our lives in this condition; sometimes, there is no rain to the point that we cannot even plant seedlings in our small gardens or even afford to buy the food we should eat. [Participant #8]
	Unavailability of community health promotion programs	No! If the nurses give us pills in the clinic, they don't do follow-up and encourage us at home. [Participant #3] We don't have any form of identified health programs for people with diabetes in my community. Sometimes, when one listens to the radio or TV, one can hear people asking questions about diabetes, but nothing happens in our communities. [Participant #14] We don't have any diabetes health program in our community that can help us with lifestyle changes and physical exercise. Even walking alone in the street is not safe because of the high crime rate in our communities, especially for older adults. [Participant #20]

Strengthening of health promotion activities

The participants acknowledged the importance of enhancing health promotion activities to facilitate the adoption of a healthy lifestyle. Ottawa Charter motivates the continuous taking of prescribed medication.

> *Dietary coaching and taking pills are important because these things are often forgotten, and we eat our maize porridge, forgetting the pills sometimes. [Participant #3]*

> *We are suffering here; we don't know diabetes mellitus very well; the nurses will tell you that you have diabetes, eat this and not eat that, and here are the pills, but they do not go into detail about how to gain the power to control the disease. [Participant #5]*

> *People with diabetes mellitus need more than health education; we need power to understand how to live with the disease. Also, to receive support from society with challenges related to diabetes mellitus. [Participant #15]*

> *We should have health promotion events where people will be made aware of the disease and be given sufficient information on how to take care of themselves. [Participant #20]*

Lack of support groups

People living with diabetes mellitus want to have support where they can encourage each other about taking treatment and lifestyle changes and to know how others cope with diabetes mellitus. Some of them do not have a support structure from home.

> *We may have a place where we come together as diabetic patients and be well equipped on how to behave and what kind of good food to eat at home. [Participant #4]*

> *There must be a place where we can meet and do physical activities as advised on TV. It does not happen when you are alone. I often see old ladies playing football on TV in other places or any other sport, but we do not have such activities here at Ngangelizwe. [Participant #5]*

> *Having support groups in our community will encourage people to take their treatment well and not default. [Participant #12]*

> *By having support groups for people living with diabetes mellitus, we will be able to discuss the challenges we are facing. [Participant #13]*

> *The availability of support groups in the community can encourage people to adhere to their treatment and practice healthy lifestyles. [Participant #17]*

Food insecurity

Participants knew that they must adhere to lifestyle changes but could not maintain a healthy lifestyle due to food insecurity. Developing personal skills to prepare their vegetables and fruits has not yet been achieved as recommended by the Ottawa Charter.

> *The most common challenge is high food prices in the marketplace, the same food we are recommended to consume. We usually buy maize meal, the only food we can afford. [Participant #5]*

> *Because we live with our grandchildren, now you must buy enough food for everyone, so we can't buy what the health care workers say we should eat. [Participant #7]*

> *We cannot meet our needs and buy healthy food to support our lives in this condition; sometimes, there is no rain to the point that we cannot even plant seedlings in our small gardens and cannot afford to buy the food we should eat. [Participant #8]*

Unavailability of community health promotion programs

Patients with diabetes mellitus at Ngangelizwe Clinic reported a lack of access to diabetes mellitus programs that are provided by the government or non-organizations.

> *Sometimes, when one listens to the radio or TV, one can hear people asking questions about diabetes, but nothing happens in our communities. [Participant #14]*

> *We do not have any diabetes mellitus program to help us understand the importance of lifestyle changes and physical exercise in our community. [Participant # 20]*

Discussion

In this study, we identified the barriers and facilitators for empowering people living with diabetes mellitus to gain control over the disease based on the tenets of the Ottawa Charter, as shown in Fig. 1. These barriers and facilitators can be utilized to guide and design health

promotion programs to empower people living with diabetes mellitus at the household and community level under the primary healthcare system [27]. The empowerment of people with diabetes mellitus should be directed towards lifestyle changes in the prevention of obesity, smoking, and unhealthy diets to motivate physical activity and control blood glucose levels [28].

The identified facilitators in this study included enhancing the role of existing community healthcare workers and strengthening health promotion activities. Some participants at Ngangelizwe complained about not accessing the complete control and support of diabetes mellitus support they needed from the community healthcare workers (CHWs). The Department of Higher Education and Training in South Africa offers accredited undergraduate and postgraduate degrees at some universities. Walter Sisulu University (WSU) previously provided a Bachelor of Science degree, a post-graduate diploma, and a Master of Science in Health Promotion. Currently, it is offering a Master of Public Health degree with components of primary health care and health promotion [29]. The National Health Promotion Policy and Strategy in South Africa stipulates the guidelines to regulate health promotion practices [19]. According to Tsolekile et al. [30], CHWs serve as mediators between patients, communities, and health systems and act as lay counselors without professional training. Therefore, CHWs need adequate training in organizing health promotion programs related to the prevention of diabetes mellitus. Non-governmental organizations train CHWs with basic skills in home-based care, and after a short course, certificates are offered [30]. Qualified health promotion practitioners should be motivated to work with CHWs to enhance proper accessibility of needs assessment, planning, development, implementation, evaluation, and research of health promotion programs. World Health Organisation recommended that healthcare professionals, particularly in PHC, be essential in nurturing health promotion [31].

The participants stated that they would like CHWs to regularly check up on them concerning their treatment and lifestyle changes in their communities. CHWs are people their community chooses to promote the health and well-being of all village/community members [30, 32]. Communities select CHW after agreeing on who they want to represent them in a bottom-up approach. CHWs usually possess the basic skills and experience and are willing to be volunteers for their community [30]. Therefore, the appointment of readily available qualified health promotion practitioners is a strategy to harness the facilitation of health promotion interventions at the community level where they are required most. The capacity building of CHWs is essential, as they work under the supervision of qualified health promotion practitioners, primary health care teams, and other health care professionals [31, 33]. Health promotion programs provide skills and support to empower people with lifestyle changes and physical exercise. These programs are designed and aligned with key areas of the Ottawa Charter to empower people and develop personal skills [9].

The identified barriers to health promotion interventions for people with diabetes mellitus included a lack of support groups, food insecurity, and unsafe neighbourhoods which impede physical activities. Participants stated that they are hardly managing themselves, and some are dependent on their families in terms of providing food on the table, taking medication, and being reminded to attend follow-up clinic visits on their appointment dates. Egger et al. [34] similarly stated that there is a gap that needs to be filled in health promotion strategies, and diabetic people are also affected. Health promotion practitioners are trained to assess needs and design relevant behavioural and lifestyle change programs that harness facilitators and redress barriers [34]. In the Ngangelizwe clinic, there are no qualified health promotion practitioners employed to empower and visit people living with diabetes mellitus in their homes.

Caperon et al. [35] stated that lack of food security is a common barrier in poorly resourced settings such as Ngangalizwe, as opined by the study participants. Circumstances force some participants to buy enough food for everyone in their families. Unfortunately, they cannot afford to buy recommended healthy food because of high prices in the marketplace. This is a serious socio-economic barrier to lifestyle modification since some people cannot afford nutritious food; they only eat daily starch like maize meal [36]. The participants suggested actions that can be strengthened to address the barriers identified. For example, establishing support groups for people with diabetes mellitus will create a platform where ideas and solutions can be discussed meaningfully [37, 38]. The availability of health promotion programs for diabetes mellitus was regarded as an absolute necessity [33]. Empowerment and raising awareness could be emphasized in a group-based and multidisciplinary client-centered approach [10, 31]. Some interventions may include exercise or combining exercise with other activities such as medication review, guidance on nutrition, and abstaining from alcohol intake and smoking [9, 12, 39].

Participants raised concerns about enhancing health promotion activities to facilitate the adoption of a healthy lifestyle. People living with diabetes mellitus need more than health education; they need power to understand how to live and control the condition. If patients with diabetes mellitus are empowered to understand the

condition, it can help to prevent or reduce severe complications and related deaths. Dietary coaching and physical activity are examples of health promotion activities that form part of the empowerment process. Knowing how to control diabetes mellitus will save money on transport, time, and going in and out of the hospital. Empowered patients with personal skills in managing their conditions live longer than those who did not get an opportunity. The empowerment process also strengthens community actions among fellow members to support one another about when to take their medication, how to monitor their blood sugar (glucose), and how to take care of themselves [12, 27, 34, 40].

Conclusion

The findings of this study indicate a gap among individuals living with diabetes mellitus at Ngangalizwe in South Africa. To address this challenge, a collaborative intervention involving key stakeholders is crucial in accessing and maintaining lifestyle changes. The study recommends that a collaborative health promotion intervention equipped with the necessary competencies be assigned to assess the needs and develop, implement, and evaluate relevant empowerment programs at the household and community levels. This approach involves active engagement with health promoters/ public health practitioners and community health workers at the local level, allowing individuals and communities to access motivation and knowledge regarding the control of diabetes mellitus. Through health promotion programs, patients can achieve improved management and control over diabetes, leading to better health outcomes for those fighting the disease.

Study limitations

One limitation of this study is that the findings are based only on those patients who were available at the clinic on the day of data collection, and only four males participated in the study. This may not be representative of the male population. Another limitation is that data was drawn from a small sample size of 20 patients from the Ngangelizwe community clinic. Therefore, the results cannot be generalized to the South African population. However, since the study was qualitative, the sample was deemed necessary, and the results can be transferable and comparable to other communities elsewhere with similar conditions, given the detailed description of our methods.

Abbreviations

CHW Community Health Worker
NGOs Non-Governmental Organizations
PHC Primary Health Care

Supplementary Information

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Additional file 1. COREQ Checklist.

Additional file 2. Interview Guide.

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Authors' contributions

O.N. collected data and conceptualised the manuscript. M.D. conceptualised the manuscript and wrote the main script. E.M. analysed data and read through the paper.

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Data availability

The raw data for this article will not be shared due to the anonymity of the participants. Reasonable anonymous raw data will be available on request from the corresponding author.

Declarations

Ethics approval and consent to participate

Data was collected after the researchers obtained an ethical clearance certificate from Walter Sisulu University, Human Research Committee (Protocol number 125/2021). All procedures in this study were performed according to the relevant guidelines and regulations in the Declaration of Helsinki [41]. Permission to conduct the study was also obtained from the National Health Research Database (EC_202110_017). Permission was also sought from the District Manager of the Department of Health. Written informed consent was obtained from all the participants who participated in this study, and all were above 18 years of age. Members of the research team could only access data that were analysed and reported anonymously.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

1. Kok A, Hariram A, Webb D, Amod A. Patterns of diabetes management in South Africa: baseline and 24-month data from the South African cohort of the DISCOVER study. J Endocrinol Metab Diabetes S Afr. 2021;26(2):60–5.
2. Mphasha MH, Skaal L, Mothiba TM. Prevalence of overweight and obesity amongst patients with diabetes and their nondiabetic family members in Senwabarwana, Limpopo province, South Africa. S Afr Fam Pract. 2022;64(1):a5409. https://doi.org/10.4102/safp.v64i1.5409.
3. Dorrington R, Bradshaw D, Laubscher R, Nannan N. Rapid mortality surveillance report 2019 & 2020. 2021. Available from: www.mrc.ac.za/bod/reports.htm.
4. Pheiffer C, Pillay-Van Wyk V, Joubert JD, Levitt N, Nglazi MD, Bradshaw D. The prevalence of type 2 diabetes in South Africa: a systematic review protocol. BMJ Open. 2018;8(7):e021029.

5. Stats SA. Mortality and causes of death in South Africa, 2017: findings from death notification statistical release mortality and causes of death in South Africa: findings from death notification 2017. 2017. Available from: www.statssa.gov.za, info@statssa.gov.za, Tel+27123108911.
6. Dube L, van den Broucke S, Dhoore W, Kalweit K, Housiaux M. An audit of diabetes self-management education programs in South Africa. J Public Health Res. 2015;4:jphr-2015.
7. Abdelalim EM. Modeling different types of diabetes using human pluripotent stem cells. Cell Mol Life Sci. 2021;78:2459–83 Springer Science and Business Media Deutschland GmbH.
8. Nyambuya TM, Dludla PV, Mxinwa V, Nkambule BB. Obesity-induced inflammation and insulin resistance: a mini-review on T-cells. Metabol Open. 2019;3:100015.
9. WHO. Ottawa charter for health promotion, first international conference on health promotion. 1986;1–4. Available from: http://www.who.int/healthpromotion/conferences/previous/ottawa/en/.
10. Labonte R, Laverack G. Capacity building in health promotion, part 1: for whom? And for what purpose? Crit Public Health. 2001;11(2):111–27.
11. Shan R, Sarkar S, Martin SS. Digital health technology and mobile devices for managing diabetes mellitus: state of the art. Diabetologia. 2019;62:877–87 Springer Verlag.
12. Scriven A. Promoting health: a practical guide, Ewles and Simnett. Elsevier; 2010. Available from: https://www.elsevierhealth.co.uk/promoting-health-a-practical-guide-9780702031397.html.
13. Liberato SC, Brimblecombe J, Ritchie J, Ferguson M, Coveney J. Measuring capacity building in communities: a review of the literature. BMC Public Health. 2011;11:1.
14. Abdelhafiz AH, Rodríguez-Mañas L, Morley JE, Sinclair AJ. Hypoglycemia in older people - A less well-recognized risk factor for frailty. Aging Dis. 2015;6:156–67. International Society on Aging and Disease.
15. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med. 2014;89(9):1245–51.
16. Kganakga JT, Bester P, Ricci C, Botha-Le Roux S, Cockeran M, Greeff M, et al. Prognostic values of modifiable risk factors for cardiovascular events in South African health promotion. PLoS One. 2022;17(8):e0271169.
17. Creswell JW. Research design, qualitative and mixed method approaches. 3rd ed. University of Nebraska-Lincoln: Sage; 2009.
18. Shanks G, Bekmamedova N, Willcocks L. Using business analytics for strategic alignment and organisational transformation. Int J Bus Intell Res. 2013;4(3):1–15. Available from: https://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/ijbir.2013070101.
19. Department of Health. The National Health Promotion Policy and Strategy. Health Journal. 2015;1–46. Available from: https://extranet.who.int/ncdccs/Data/ZAF_B12_The-National-Health-Promotion-Policy-and-Strategy%202015_2019.pdf.
20. Igumbor EU, Puoane T, Gansky SA, Plesh O. Pain as a reason for primary care visits: a cross-sectional survey in a rural and periurban health clinic in the Eastern Cape, South Africa. S Afr Fam Pract. 2012;54(3):256–63.
21. Miles B, Huberman A, Saldana J. Qualitative data analysis: a method sourcebook. 3rd ed. Thousand Oaks: Sage, Arizona State University; 2014.
22. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3(2):77–101.
23. Streubert HJ, Carpenter DR. Qualitative research in nursing, advancing the humanistic imperative. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2007.
24. Babbie E, Mouton J. The practice of social research. Cape Town: Oxford University Press Southern Africa; 2001.
25. Polit DF, Beck CT. Generalization in quantitative and qualitative research: myths and strategies. Int J Nurs Stud. 2010;47(11):1451–8.
26. Lincoln Y, Guba E. Naturalistic inquiry. Beverly Hills: Sage; 2005. Available from: http://www.qualres.org/HomeLinc-3684.html.
27. Ong WM, Chua SS, Ng CJ. Barriers and facilitators to self-monitoring blood glucose in people with type 2 diabetes using insulin: a qualitative study. Patient Prefer Adherence. 2014;8:237–46.
28. Asif M. The prevention and control the type-2 diabetes by changing lifestyle and dietary patterns. J Educ Health Promot. 2014;3(1):1.
29. Walter Sisulu University. Postgraduate Studies at WSU; Available from: https://www.wsu.ac.za/index.php/en/research-innovation/post-graduate-studies-at-wsu.
30. Tsolekile LP, Puoane T, Schneider H, Levitt NS, Steyn K. The roles of community health workers in the management of non-communicable diseases in an urban township. Afr J Prim Health Care Fam Med. 2014;6(1):E1-8.
31. WHO, Health promotion: a discussion document on the concept and principles. WHO. 1984; https://iris.who.int/handle/10665/107835.
32. Seutloali T, Napoles L, Bam N. Community health workers in Lesotho: experiences of health promotion activities. Afr J Prim Health Care Fam Med. 2018;10(1):e1–8.
33. Werfalli M, Murphy K, Kalula S, Levitt N. African journal of primary health care & family medicine. 2019; Available from: http://www.phcfm.org.
34. Egger G, Spark R, Lawson J, Donovan R. Health promotion strategies & methods. Third Edit. Sidney, Australia: The McGraw-Hill Companies; 2013.
35. Caperon L, Arjyal A, Puja KC, Kuikel J, Newell J, Peters R, et al. Developing a socio-ecological model of dietary behavior for people living with diabetes or high blood glucose levels in urban Nepal: a qualitative investigation. PLoS One. 2019;14(3):e0214142.
36. Pinchevsky Y, Raal F, Butkow N, Chirwa T, Distiller L, Rothberg A. Quality of care delivered to type 2 diabetes mellitus patients in public and private sector facilities in Johannesburg. S Afr Int J Gen Med. 2018;11:383–90.
37. McCloskey J, Flenniken D. Overcoming cultural barriers to diabetes control: a qualitative study of southwestern New Mexico Hispanics. J Cult Divers. 2010;17(3):110–5 PMID: 20860336. Fall.
38. Bateganya MH, Amanyeiwe U, Roxo U, Dong M. Impact of support groups for people living with HIV on clinical outcomes: a systematic literature review. J Acquir Immune Defic Syndr Lippincott Williams and Wilkins. 2015;68:S368-74.
39. Echouffo-Tcheugui JB, Dagogo-Jack S. Preventing diabetes mellitus in developing countries. Nat Rev Endocrinol. 2012;8:557–62. Nature Publishing Group.
40. Gallagher EJ, LeRoith D. Insulin resistance, obesity, and cancer. Curr Diab Rep. 2010;10:93–100.
41. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191–4.

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