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RESEARCH ARTICLE

Self-management Strategies for Patients with Risk Factors to Reduce the Impact of Cardiovascular Disease in Selected Clinics in Limpopo Province, South Africa

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Abstract:

Background:

Cardiovascular diseases are now the leading cause of death worldwide, amounting to 17.8% of all deaths recorded. In Sub-Saharan Africa, it contributes to about 13% of deaths, whereas 80% were recorded from developing countries. A quarter of all deaths are attributable to behavioural and metabolic risk factors due to patients' lack of self-management strategies, which are practices and activities that the patients can use and manage themselves, effectively preventing the development of CVD.

Objective:

The study aimed to explore patients at risk of CVD's knowledge of self-management strategies to prevent the development of CVD.

Methods:

This was a qualitative exploratory and descriptive study conducted in four primary health care settings in two contexts (*i.e.*, a rural and peri-urban setting) in the Capricorn District of Limpopo Province, South Africa. The target population were patients with risk factors and diagnosed with either hypertension or diabetes mellitus. Twenty-five patients (male n=9; female n=16) were purposefully sampled and participated in semi-structured individual interviews with a schedule guide. The data was analysed using thematic Tesch's open coding qualitative data analysis method.

Results:

Thematically analysed data resulted in three main themes and their related subthemes enumerating patients at risk of CVD's knowledge regarding disease onset, risk factors, and self-management, including daily challenges affecting disease progression. The major themes isolated are 1) knowledge related to CVD onset, symptoms, and self-management strategies, 2) challenges experienced by persons at risk of developing CVD, 3) suggestions to help improve health and the prevention of the onset of CVD.

Conclusion:

The study concludes by recommending in-depth CVD awareness and education programs for patients at risk. More importantly, the provision of mental health awareness, counselling, and equipping patients with coping skills are recommended.

Keywords: Cardiovascular diseases, Self-management strategies, Clinics, Risk factors, HIC, Global deaths.

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1. INTRODUCTION

Cardiovascular diseases (CVDs) are now the leading cause of mortality, accounting for an estimated 73.4% of all global

deaths [1]. The prevalence of heart failure among adults in high-income countries (HIC) is approximately 1–2% and increases with age to more than 10% in people aged 70 and above. The World Health Organization (WHO: 2017) reported that over 80% of CVD deaths were recorded in developing countries, with ischemic heart disease being the most frequent cause of death [2]. CVDs are now a public health problem

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throughout the world, and in Africa, the burden of CVD is increasing rapidly [3]. In sub-Saharan Africa (SSA), CVD mortalities account for about 2.6 million deaths, equivalent to about 35% of all deaths recorded yearly [1]. The prevalence of hypertension in SSA varies from 5% to 50%, diabetes averages 7% for adults, whilst in most economically developing countries like Nigeria, Ethiopia and Egypt, it ranges between 19% and 30%. In South Africa (SA), CVD is responsible for almost 1 in 6 deaths (17.3%) [4]. A recent hypertension prevalence study conducted in selected South African rural and semi-urban areas found that 38% of community members were at moderate risk of developing CVD whilst 9% of the members were at high risk. Ntuli, Maimela, Alberts, Choma, and Dikotope (2015) reported that CVD and related conditions are the leading cause of death in SA after HIV and AIDS. For instance, over 78 000 South Africans die each year from heart disease, and there are no signs of a decrease in the foreseeable future. The leading risk factors contributing to CVD are hypertension and diabetes, tobacco usage (9%), being overweight (7.1%), alcohol use (5%), and physical inactivity (5%) [5]. In SSA, hypertension and diabetes mellitus are emerging in both the rural and urban settings, resulting in increasing pressure being put on acute and chronic health care services. The upward trajectory of CVD burdens the already burdened, under-staffed, under-resourced, and under-funded health care systems in most parts of SSA [6].

Nearly, a quarter of all CVD deaths are attributable to behavioural and metabolic risk factors that individuals can modify. Despite CVD risk factors being modifiable, the prevalence and incidence of the conditions are on the rise globally [7]. In rural areas, patients are faced with significant health disparities and risk factors due to many unique challenges associated with where they live. Risk factors include a poor diet, a high rate of obesity and low rates of physical activity, which are associated with several negative health effects, including stroke and CVD outcomes [8].

Tsai (2017) indicates that, unfortunately, rural residents often have limited access to healthcare services to address CVD and other health concerns [9]. A scarcity of primary and speciality care providers, long distances to travel to reach services, and unreliable transportation together create an environment in which individuals often do not receive the care necessary to maintain optimal health. A study conducted by Swartwout, Deyol and El-zein (2018) maintains that, given this reality, it is unsurprising that rural populations also bear a disproportionate burden of disease and disease risk [10]. In this regard, there were no promising initiatives undertaken to confront poor health outcomes in these rural communities.

For patients with CVD risk factors, self-management is considered the best method for lowering their risk and maintaining their quality of life [9]. Amongst others, patient awareness and knowledge of CVD could come in handy in the management of CVD [11]. Unfortunately, the majority of people in South Africa, especially those living in townships and rural areas, were reported to lack knowledge and awareness of CVD and ways to mitigate against the risk [6, 8]. Disease knowledge and awareness are important because they could lead to lifestyle changes or better self-management, which become important in CVD prevention and management [12]. To prevent CVD and its impact, it is believed that

individuals have to employ various relevant self-management strategies which will assist in achieving a healthier lifestyle while maintaining their quality of life [7, 6]. In the Western World, as well as Low- and Middle-Income countries' health systems, there are no self-management centres at the community level to empower patients with knowledge on how to care for themselves to improve their quality of life [1].

The Manual for Health Promotion, Department of Health, South Africa, (2018) recommends that to become a healthy nation and prevent CVDs, South Africans need to make informed decisions about what they eat, whether or not they consume alcohol, stop smoking, and, participate in physical activity among other factors [13]. Despite significant improvement in health research in the African region since 2000, the quality of information on the determinants of health and disease and studies of the implementation of effective preventive and therapeutic strategies remain scanty [14]. A study done in the Dikgale rural area in Limpopo Province revealed a high prevalence of behavioural and biomedical risk factors for non-communicable diseases. Approximately one in three study participants were found to be hypertensive, starting at a young age of 15 to 24 years. Approximately 90% of the participants were below the WHO recommendations for fruit and vegetable consumption, and more than half had low physical activity levels. A quarter of the participants were overweight and obese, while one in three had high total cholesterol levels. A lack of knowledge of chronic diseases was predominant among patients, nurses and community health workers [6, 8].

Identifying individuals at risk for CVD and assisting them to change their behaviour is an important strategy to prevent CVDs. For people already diagnosed with hypertension and diabetes mellitus, modifying their lifestyle and adhering to medical interventions are important for secondary prevention of CVDs. [6, 15]. Patients need to manage their chronic diseases for a lifetime [6]. Disease self-management, or the patients' ability to apply disease knowledge and engage in strategies that help maintain their health, has been effective in reducing death and hospitalisation rates [16]. As such, it is essential to raise awareness by campaigning and providing information to empower rural and semi-urban communities with various CVD self-management strategies. [17]. In light of the background provided, clinicians should help patients identify and mitigate their health risks by, among other things, encouraging them to engage in strategies that promote physical and psychological health, thereby reducing their risks. [18]. Research also needs to be conducted to examine the lifestyles of rural people, including their knowledge of self-management strategies, especially for those at risk or diagnosed with cardiovascular disease.

2. METHODOLOGY

2.1. Materials and Methods

2.1.1. Study Design

This was an explorative and descriptive qualitative study that adopted a contextual approach [18]. By adopting a contextual approach, the authors were mindful that the study was going to be operationalised in two contexts (*i.e.*, a rural and peri-urban setting), which would present unique social, cultural, historical and individual realities. For instance, in the rural area, the investigators were required to consult with and

seek gatekeeper permission from the relevant tribal authorities in addition to the permission that was granted by the local government [19]. On the other hand, access to participants in the peri-urban area only required the investigators to use the permission letters obtained from the local government. The flexibility, based on the contextual circumstances, allowed the investigators to access both research sites with ease.

2.2. Study Setting

The present study was conducted in four primary health care clinics located in the Polokwane Municipality of the Capricorn District, Limpopo Province, South Africa. Polokwane Municipality is demarcated into rural, peri-urban and urban areas. Specifically, we focused on two clinics in the Ga-Molepo local area (a rural area), and two in the Seshego area, which is considered to be peri-urban.

2.3. Population and Sampling

The study population comprised twenty-five visiting patients identified as having risk factors, which included hypertension and diabetes, in the four selected primary health care clinics situated in Limpopo Province, Capricorn District. The study adopted the non-probability purposive sampling technique to select 25 patients attending primary health care clinics in the selected areas. The participants included in the study were selected based on their risk factors for CVD development and their availability on the day fieldwork was conducted in the respective clinics. Patients on hypertension and diabetes treatment were accessible on those specific days. The selection criteria also targeted those patients who had been on treatment for at least 6 months. The justification for the use of purposive sampling is that it allows the researchers to select participants who have insight and understanding of the phenomena [20]. its merely incremental or repetition. Sampling continued until a point of saturation, as recommended by Creswell (2014) [21].

2.4. Data Collection Procedure

Upon attaining ethical clearance and permission from the local health department, the 1st author approached the clinic manager and was granted access to the clinic's patient database health appointments list/book. She reviewed the appointment lists in each clinic, isolating patients diagnosed with either hypertension or diabetes as well as patients with risk factors like smoking and obesity at the targeted clinics. Upon gaining access to clinics and participants, informed consent was obtained from all participants before each semi-structured interview session could commence.

The primary investigator collected data in November 2019 using a semi-structured interview guide. The rationale for using the interview guide helped gain a detailed picture of the in-depth knowledge of participants concerning the problem being studied [22]. Face-to-face interviews were conducted in a private room free from distractions. Interview sessions were audiotaped, and field notes were written to capture non-verbal cues. To ensure consistency, all participants were asked one central question using semi-structured interviews. Each participant was requested to respond to the following

exploratory question: *“How do you manage yourself in the prevention of CVD impact?”* This was followed by probing questions that were based on the interview guide and areas that needed to be clarified about each participant's responses to the central question. Data collection occurred concurrently with data analysis. The 1st author continued to collect data from patients and stopped when data saturation reached the 25th patient when no new information was forthcoming.

2.5. Data Analysis

Tesch's open coding method of qualitative data analysis, as described by Creswell (2014), was used to analyse the data [21]. The voice-recorded information was transcribed verbatim by the 1st author. The researcher read through each transcript to gain a general sense of each participant's knowledge regarding the studied topic. In the process, units of meaning started emerging and clustered together. Similar meanings were grouped and clustered as themes and sub-themes. The researchers applied the list of themes to the data. The themes were abbreviated as codes, which were written next to the appropriate segments of the transcripts. The researchers tried out this preliminary organising scheme to see whether new categories and codes emerged. The researchers then found the most descriptive wording for the themes and categorised them. Lines were drawn between categories to show the relationships. The researchers made a final decision on the abbreviation for each category and alphabetised the codes. The data material belonging to each category was assembled, and a preliminary analysis was performed. The participants' direct excerpts were further used to amplify the themes and sub-themes that had emerged. Three themes and eleven sub-themes supported by verbatim statements were generated.

2.6. Measures to Ensure Trustworthiness

Trustworthiness refers to the demonstration by the researcher that the evidence for the results reported is sound and the argument made based on the results is strong by maintaining high credibility, dependability, confirmability, and transferability [22].

Polit and Beck (2018) described credibility as the confidence in the truth and interpretation of the data. Credibility seeks to ensure that the study measures or tests what it is intended to [21]. To ensure credibility, one-on-one audiotaped interviews were conducted on the prevention of CVDs with patients who have been treated for hypertension and diabetes mellitus. Credibility was also ensured by prolonged engagements with the participants during data collection to build rapport. Transferability and dependability were ensured through an in-depth description of the research methodology. To ensure confirmability, the proposal, the voice recordings, and the transcribed data were sent to an independent coder. Thereafter, a meeting was held to compare the themes and sub-themes of the co-coder and the researchers. These were compared, differences were discussed, and a consensus was reached between the co-coder and the researcher.

2.7. Ethical Considerations

Ethical clearance was sought and obtained from the Turfloop Research and Ethics Committee (TREC/318/2019:19). Permission to access the clinics was obtained from the Limpopo Provincial Department of Health before conducting all the interviews. The lead researcher explained the study's aim and obtained informed consent from each participant. To maintain confidentiality, each interview was anonymised. The aim and nature of the study were explained to the participants before data collection. The names of the participants were not used, but numbers were allocated to each participant to ensure anonymity and confidentiality. Anonymity was ensured by using numbers as participant identifiers. Participants were further informed that their names will be protected in the presentation and publication of the study. They were also informed that they could withdraw from the study at any time, without any repercussions.

3. RESULTS

Below are the themes and sub-themes that emerged from the data (Table 1):

3.1. THEME 1. Knowledge Related to CVD Onset, Symptoms and Self-management Strategies

The findings revealed that knowledge related to self-management when living with hypertension or diabetes mellitus is divided into two ways: as a portfolio of techniques and tools that assist patients to choose healthy behaviours and as a fundamental transformation of the patient-professional relationship into a collaborative partnership, encompassing more than a didactic, instructional program that goes beyond simple dissemination of information or disease state management. This theme is illustrated by the following subthemes:

3.1.1. Sub-theme 1.1: Knowledge Related to the Onset and Risk of CVD Evident

From the findings, it emerged that participants lacked in-depth knowledge related to the onset of CVD. Despite this, some displayed knowledge regarding symptoms associated with CVD, *i.e.*, feeling dizzy, chest pains, and difficulties breathing. More pronounced in the results was the knowledge that heart diseases can be triggered by mental distress secondary to ill health or life problems. The following participant extracts enumerate from this subtheme: *Participant S0019: "I don't know about the onset because I don't have CVD, but what I know is signs and symptoms that you can have, chest pains and feel dizzy and have difficulty breathing is what I know about heart attack."*

Participant S005:—"A person can get heart diseases especially when you are having serious illness and you can't get it out of your head and you keep on thinking about it. Your heart will start to be affected by pumping very fast and you will also feel like fainting (shaking head), not sure but that is my input"

Table 1. Themes and Subtheme.

Themes	Sub-themes
1. Knowledge related to CVD onset, symptoms and self-management strategies	1.1. Knowledge related to the onset and risk of CVD evident 1.2. Knowledge related to self-management strategies by hypertensive and diabetes mellitus patients noticed 1.3. Existing knowledge related to the causes/contributory factors of CVDs. 1.4. Existence <i>versus</i> lack of knowledge related to the relationship between risk factors and the development of CVDs 1.5. Suggestions regarding treatment and lifestyle changes to help maintain good health and reduce the risk of developing CVDs
2. Challenges experienced by persons at risk of developing CVD	2.1. Poor adherence to hypertension/diabetes medications and maintenance of a healthy lifestyle identified as a challenge 2.2. Ongoing mental stress as a challenge that could predispose patients to the onset of CVD
3. Suggestions to help improve health and the prevention of the onset of CVD	3.1. Adherence to a healthy diet and maintaining a healthy lifestyle stabilise hypertension and diabetes mellitus 3.2. Regular medical check-ups are encouraged 3.3. Avoidance of exposure to stress when living with hypertension and diabetes mellitus recommended

Participant S005: "Heart diseases are caused by unresolved problems. People need not to think too much to avoid stroke because if you don't share your problems or maybe consult social workers to intervene in your problems so that you must have peace and your heart will be protected."

Another participant shared her knowledge by saying, "what I know about heart disease is that is when people are always hurting and you don't have a way to stop it, your heart will explode and then you can faint."

This subtheme shows that despite lacking medical knowledge regarding CVD, participants demonstrated some knowledge regarding some symptoms associated with heart diseases. Knowledge regarding risk factors such as a stressful lifestyle was also evident.

3.1.2. Sub-theme 1.2: Knowledge Related to Self-management Strategies by Hypertensive and Diabetes Mellitus Patients Noticed

Another observation made was the knowledge related to self-management strategies by hypertensive and diabetes mellitus patients. This finding is captured herein:

Participant S003: "Hei, hei, I really don't know! Maybe if they can come to the clinic and listen to nurses and take their treatment very well they will be ok."

Participant B009: "Taking treatment every day and avoiding stress. This lifestyle will help prevent heart disease, and another thing, let's move away from the lifestyle of alcohol. You know what is bad is that even our children drink at an early age, so those who are ill should eat too much fruits

and vegetables.”

3.1.3. Sub-theme 1.3: Existing Knowledge Related to the Causes/Contributory Factors of CVDs

The participants went on to associate CVD onset with mental distress such as anger and preoccupation with life problems.

Participant S0041: “Heart disease is a disease that is caused by anger if a person is angered easily you can get heart disease, but for myself, if somebody angered me I drink a lot of cold water and it helps to ease my heart, this helps me to stay healthy.”

Participant S0013: “I think heart disease is caused by thinking too much, not solving your problems with people and always feeling dizzy because your heart will be full with anger and problems.

3.1.4. Sub-theme 1.4: Existence versus Lack of Knowledge Related to the Relationship between Risk Factors and the Development of CVDs

The results displayed that participants knew about the relationship between risk factors and CVD onset which is supported by the following statements:

Participant S007: “If you are not taking treatment, especially for hypertension, you can get stroke and heart attack because your blood will be high and break and cause heart attack so we need to be careful if we are diagnosed we must take treatment regularly.”

Participant S002: “I think even overweight can cause a heart attack, because if you are overweight you can't breathe properly due to too much fat and also you will experience difficulty walking. I think this is the congestion of the blood that does not flow correctly.”

Participant B0112: “I don't know really, but I think taking alcohol too much, and not taking treatment, especially for hypertension, you can get heart problems, because you will sweat, feel dizzy and that is then when your heart stops.”

3.1.5. Sub-theme 1.5. Suggestions Regarding Treatment and Lifestyle Changes to Help Maintain Good Health and Reduce the Risk of Developing CVDs

The findings highlighted that participants knew the importance of treatment adherence and healthy lifestyle changes when living with hypertension or diabetes mellitus. This further demonstrated their knowledge that such changes are key to the improvement of the affected's quality of life:

Participant S4 0012: “I think visiting the clinic monthly to be checked by nurses and also the community health workers should visit and check us in our homes to check us for CVD, and another thing if we can avoid stress and eat good diet that is recommended by the doctors like cabbage and traditional vegetables, stay away from stress and arguments because that is where troubles start and your heart will be swollen and you will be unable to live a normal life.”

Participant S0014: “Myself, when I was still working I used to buy nice things, but since I'm no longer working I

engage myself with home chores like ploughing cabbages and mealies and treatment as told. For people to avoid CVD they should exercise, eat lots of vegetables like traditional vegetables and not to put a lot of salts in their food.”

3.2. THEME 2: Challenges Experienced by Persons at Risk of Developing CVD

Several challenges that could predispose participants to develop CVD were noticeable in the study. Challenges that were identified by participants are captured herein:

3.2.1. Sub-theme 2.1: Poor Adherence to Hypertension/Diabetes Medications and Maintenance of a Healthy Lifestyle Identified as a Challenge

Adherence to a healthy diet was identified as a challenge for various reasons. For instance, *Participant S009* explained as follows: “I know that you should not take too much salt and have to take off fats from the meat, but is difficult as I'm not cooking for myself. I'm staying with my sister's children since she has passed away. They are the ones that are cooking and they sometimes put too much salt in my vegetables and I get angry as I have told them not to put too much salt in my food, but if I cook for myself I adhere to the principles.”

Although it is difficult to strictly stick/adhere to a healthy diet to prevent the onset of CVD, some participants do make efforts to eat healthily:

Participant B0011: “I try by all means to tolerate the given rules of not eating fatty foods like atchaar, spices and sweet foods. I exercise every day because I walk the distance to work. But since 2015 I have not been OK; sometimes I think I will develop CVD, because after the death of my husband my blood pressure is uncontrollable, because I always think of him and no one is supporting me, my children are still small. I'm not coping, no one to share my problems with (tears in her eyes). I just put my trust in God, hoping that one-day things will change.”

Although some patients may be eager to lead a healthy lifestyle, there are challenges beyond their control that predispose them to CVD.

3.2.2. Sub-theme 2.2: Ongoing Mental Stress as a Challenge that Could Predispose Patients to the Onset of CVD

The chronic nature of diseases like diabetes and hypertension was associated with mental distress in this study. It also included general life problems. Distress was regarded as a condition that could affect the prognosis of the disease as most of the participants struggled to cope with the illnesses:

Participant S0076 “Sister (referring to the interviewing nurse) life is hard. I have lived a miserable life. That is why I am a heavy smoker. You know, I am not working my wife divorced me. I just leave alone without food sometimes. I feel like I'm having a mental block or going crazy otherwise I will get a heart attack.

Participant S4009: “You know my blood pressure is always high, I'm feeling dizzy and having a headache, so I think I will die of a heart attack, because my daughter always

insults me, and leaves the child with me the whole night. She takes the whole SASSA money (referring to government social grant) with her so you see this is a serious challenge because I'm not supposed to have stress, but this experience will send me to an early grave."

Participant B0015: "Eish sister as you can see I'm overweight and on hypertension and sugar diabetic treatment. So because of this I sometimes... I'm unable to breathe and my heart is beating fast, especially if I work hard, but I make sure I take treatment."

The above quotation, in particular, captures the essence of the mental distress associated with living with risk factors for CVD. As a result, some patients turn to traditional herbs to better manage the risk factors. Participant S008 explained: *"I trust in western medicine although sometimes I do use traditional herbs like moringa to prevent many incurable diseases so we need to come to the clinic to check if we are having problems. Jaa, but sometimes life is hard. Life is hard, sister, even though I try to manage myself, but it is hard (looking up with tears in my eyes). I have only one child and that child is like a thorn in my heart because he is always insulting me, bringing different girls into my house. I am not supposed to talk about anything. I tried to report him to the police, but they always release him. I am very bad at preventing heart disease. I might die of heart disease because of this boy."*

3.3. THEME 3: Suggestions to help improve health and the prevention of the onset of CVD

3.3.1. Sub-theme 3.1: Adherence to a Healthy Diet and Maintaining a Healthy Lifestyle Stabilise Hypertension and Diabetes Mellitus

According to the study, adherence to treatment and a healthy lifestyle led to stabilising hypertension or diabetes mellitus, as confirmed by the following participants:

Participant B009: "According to my knowledge, I practice a healthy life because I eat a low-fat diet. You know sister as a pensioner I have bought my own fridge in my bedroom where I store my food like milk, cheese, butter, fish and drinks with low sugar like Tab. I also cook for myself, because I want my healthy diet free from salt and sugar and also I must spend my money wisely as I'm no longer working."

Participant S004: I manage myself by making sure I eat healthy meals. You see my wife died in 2015 and I'm left with 4 children, all of them taking care of me. You, I'm wearing Adidas clothes and shoes, I'm well taken care of. In the case of diet, I'm taking too much vegetables and fruits, because I'm staying alone, but have many chickens, well protected in a fence. I eat those chickens, because they are healthy, unlike the ones from the fridge, because they cause painful leg."

Participant S007: "As a young person I jog every morning as exercise is equal to healthy living and on the issue of meat I prefer breast meat without skin. The other that I take on a daily basis is lemon with hot water because it is one of the detoxification and I pray a lot and meditation and make sure I go to clinic every month it helps me to keep my mind healthy."

3.3.2. Sub-theme 3.2: Regular Medical Check-ups are Encouraged

Participants in the study were encouraged to undergo regular medical check-ups to prevent CVD, according to the study findings.

Participant S008: "You must always go to health facilities to check your health."

Participant S4006: "I think visiting the clinic monthly to be checked by nurses and also the community health workers should visit and check us in our homes for CVD"

3.3.3. Sub-theme 3.3: Avoidance of Exposure to Stress when Living with Hypertension and Diabetes Mellitus is Recommended

Coping with stress was recommended as a necessary skill in this study. Seeking counselling whenever needed was also indicated as a necessary self-care strategy.

Participant B002: "I make sure that I don't get heartache by staying alone because I was staying with my son and after some arguments with his wife they moved out but anywhere I have made peace with it. I'm staying alone and I have peace because no more arguments"

Participant S0013: "By having a problem and not getting counselling. Like myself, I was having a serious problem and was transferred to the hospital, and counselled by a social worker. She stressed that I don't need a smoke in my heart (laughing) as it may cause my heart to explode. So if you experience a problem, share, and get counselling."

Another participant supported this view on the importance of managing stress, diet, and physical activity:

Participant B002: "I exercise regularly by ploughing the field, and also make sure I don't eat spicy food and fats, but above all I drink a lot of water, eat vegetables and fruits and by avoiding stress it helps me a lot because my blood pressure is always normal and by that I think I prevent heart disease."

The act of actively engaging in self-care activities helps improve one's health and well-being. Adherence to a healthy lifestyle is viewed as an important factor that plays a role in the prevention of complications and management of glucose and blood pressure in this study. The study findings further indicated that although patients are aware of risk factors associated with CVD, they are faced with numerous challenges affecting disease prognosis. Due to the difficulties experienced by people with hypertension and diabetes mellitus, the treatment and adaptation of self-care behaviours in chronic diseases is a slow process.

Mental stress emerged as a compounding factor in the mitigation of CVD onset. All participants are aware of the importance of self-management, including avoiding mental stress. Unfortunately, it is evident that some life problems are beyond their control and could pose a risk to their suffering heart diseases. Key strategies recommended for the prevention of the onset of CVD included regular medical check-ups, follow-up visits to health centres, and health awareness and education. Overall, we found that although participants in this

study lacked in-depth knowledge of CVD onset, they were aware that CVD progression may be slowed by proper self-management.

4. DISCUSSION

Self-management includes individual (lifestyle management), societal (awareness management), national (health policy decisions), and global (health strategy) elements, with target actions such as multi-sectoral partnership, knowledge and information management, and innovations [6]. The study findings illustrate that positive outcomes for effective self-management include improvements in clinical indicators, health-related quality of life, self-efficacy (confidence to self-manage), and disease knowledge or control. A notable gap identified in the literature was a lack of knowledge about heart diseases' onset. This is understood to pose challenges for self-management, as many individuals have more than one health condition which sometimes they were not aware of when they started [4, 23]. Contrariwise, in this study, participants knew CVD risk factors. More importantly, participants were making efforts to lead a healthy lifestyle despite unavoidable life stressors confronting them daily.

Positive outcomes of the present study imply that knowledge related to self-management included taking treatment regularly and avoiding risky behaviour, *e.g.*, avoiding stress, unhealthy diet and regular exercise [24]. Mental distress emerges as a potentially silent yet important risk factor for CVD development in the study. Most participants in this study highlighted having suffered mental distress, which impacted the quality of their already troubled physical health. Mental stress can be linked to changes in the way blood clots, which increases the risk of a heart attack or stroke. Bundy, Li, Stuchlik, Bu, Kelly, Mills, He, Chen and Whelton [25, 26] (2017) indicated that people with chronic diseases such as diabetes, or hypertension, have to deal with emotions such as anger, frustration, and depression [27]. Experiencing highly charged emotions or generally being stressed can increase risk factors, such as cholesterol and other unhealthy eating habits, such as eating junk food, *e.g.*, chips and too much salt and sugar [28 - 33]. This particular finding suggests that it is imperative that the mental health of patients at risk of developing CVD needs to be prioritised. Country-specific CVD prevention programs need to also upscale mental health care services and ensure the ease of accessibility and affordability of the services. At the individual level, new strategies may help improve patient self-management and induce sustainable behaviour change [25]. The study also suggests that knowledge related to the causes of CVDs exists, but patients with hypertension or diabetes mellitus require upskilling and sustained patient behaviour changes. Risk factors associated with CVDs should also be explained to patients [8, 25].

A patient's ability to self-manage over time, as well as aiming to achieve the goal of long-term sustainability for improved self-management, is determined by many contributory risk factors for heart diseases. One important goal of self-management support is to provide the patient with problem-solving skills to recognize challenges in their chronic

disease management and generate a plan to forge a solution [27]. Interventions should be tailored to patient needs and may include a combination of strategies to improve a patient's disease or treatment knowledge, independent monitoring of symptoms, encouraging strategies and enhancing responsibility in medication adherence and lifestyle choices [28]. Patients need to also understand the barriers to controlling disease, especially in rural settings, like medication accessibility, lifestyle modifications, including diet, alcohol avoidance and promoting education [30]. Achieving optimal self-management behaviour is difficult and demands a substantial effort from the patient. Managing a chronic illness is a time-consuming and complex process. Patients and their caregivers are required to make day-to-day decisions about such actions to avert the risk of suffering CVD.

5. RECOMMENDATIONS

Primary health care facilities manage with a high number of patients with hypertension, diabetes mellitus and other risk factors, like smoking, alcohol and obesity. Due to staffing problems, patients are rarely provided with quality care. Nonetheless, in-depth CVD awareness and education programs are needed to help slow patients' progression to CVD conditions. To prevent complications in CVD-prone patients, there must be effective strategies for self-monitoring, knowledge of the risk factors and management of chronic conditions. Provision of mental health awareness, counselling, and equipping patients with coping skills are recommended. This could be one strategy to help delay patients at risk of CVD from suffering from the conditions. Generally, empowering patients with coping skills and knowledge of self-management is imperative for health care programs to be sustainable.

CONCLUSION

Disease knowledge, self-management and patient-tailored physical and mental health care services are central to CVD risk reduction. Patients and families, including the communities, should have the ability to promote and maintain health, prevent disease, and cope with illness and disability with or without the support of a health care provider. Health workers should continuously have guidelines aimed at screening patients with risk factors for prevention and control of CVDs, while ongoing management of non-communicable diseases should be monitored. Other risk factors should be self-managed at home by patients and their families while being supported by health care professionals.

AUTHORS' CONTRIBUTIONS

MN Kgatla was responsible for the conceptualisation; MN Kgatla, TM Mothiba, M Makgahlela, and T Sodi were responsible for the methodology; MN Kgatla, TM Mothiba and RN Malema were responsible for the formal analysis; MN Kgatla and M Makgahlela were responsible for the investigation; MN Kgatla, TM Mothiba and RN Malema wrote the original draft; MN Kgatla, TM Mothiba, M Makgahlela, and T Sodi wrote, reviewed and edited the manuscript; MN Kgatla, TM Mothiba, M Makgahlela, and T Sodi were responsible for the visualisation; T Sodi acquired the funds.

ETHICAL STATEMENT

Ethical clearance was sought and obtained from the Turfloop Research and Ethics Committee (TREC/318/2019:19).

CONSENT FOR PUBLICATION

Informed consent was obtained from all the participants before data collection.

AVAILABILITY OF DATA AND MATERIALS

The data used to support the findings of this study are available from the corresponding author upon request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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