Chapter

Cost-Effective Interventions to Curb Cardiovascular Diseases in Africa

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Abstract

Cardiovascular diseases (CVDs) are the leading cause of death globally and in Africa, and the cost of care is expensive. Finances of the state may need to be re-channeled to CVDs leading to delay in the development of the country and that of the family since the cost of care also burdens the family. Cost-effective interventions to curb the prevalence and incidences of CVDs are required. A comprehensive literature search was conducted. The risk factors include unhealthy diet, physical inactivity, tobacco use, and harmful use of alcohol. On that background, the CVD can be prevented through behavioral interventions aimed at addressing these risk factors. Moreover, behavioral interventions could be helpful in minimizing costs of care and curb prevalence of cardiovascular diseases. Behavioral interventions have been found to be cost-effective and assist in the management of cardiovascular diseases. Therefore, healthcare providers must at each consultation sessions with patients emphasize more on behavioural change. They must help patients visualize the do's and dont's for the successful attainment of their health goals. In doing so, healthcare providers must collaborate among themselves and also collaborate with communities and families of patients. At the same time, it is significant to alter false perceptions and attitudes toward cardiovascular diseases to help individuals develop positive attitudes.

Keywords: cardiovascular diseases, cost-effectiveness, behavioral changes, factors, healthcare providers

1. Introduction

Cardiovascular diseases (CVDs) are regarded as a broader concept describing diseases of the heart or blood vessels, including coronary heart disease, cerebrovascular disease, rheumatic heart disease, and other conditions [1]. The development of CVD is linked with build-up of fatty deposits in the arteries resulting in a condition called atherosclerosis, increased risk of blood clots, and damage to arteries in organs such as the brain, heart, kidneys, and eyes [2]. Detection of cardiovascular diseases at an early age permits possible management before the development of adverse effects, which may be costly to manage. The risk for the development of CVD includes behaviors such as unhealthy diet, physical inactivity, tobacco use, and harmful use of alcohol [3]. The effects of these behaviors may present in the form of increased blood

pressure, glucose, and lipids, including overweight and obesity. On that background, the CVD can be prevented through behavioral interventions aimed at addressing these risk factors [3]. Moreover, behavioral interventions could be helpful in minimizing costs of care and also curb prevalence of cardiovascular diseases.

The care of cardiovascular disease is expensive and requires more state resources leading to delay in the development of the country due to increased healthcare expenditure and diminished productivity from disability, premature death, and absenteeism [4]. It has been reported that patients diagnosed with cardiovascular diseases incur more than double the medical costs as compared to a patient without CVD of the same age and sex [5]. Patients living with cardiovascular diseases and requiring medical treatment are unable to receive such due to financial constraints. These financial implications manifest themselves in the form of physical barriers (transportation to the healthcare facility), and system barriers (lack of medication at the healthcare facilities) [6]. It has been discovered that patients experience financial barriers related to payment of medical costs and visit to health care which may require transportation costs [7]. In addition, in the event of long queues at the healthcare facilities, patients may need lunch money. Furthermore, it has been found that there are also indirect financial barriers, which may occur when a certain patient who has a child may need to pay for someone to look after the child while visiting the healthcare facilities [6]. Various studies have indicated that patients experiencing financial barriers are likely not to adhere to medical therapies or health behavior change due to direct or indirect financial costs [8, 9]. On that basis, patients' outcomes are impacted by financial barriers and cost-related non-adherence, leading to deterioration in the quality of life, poor health status, and general well-being, and may also increase the rates of hospitalization [6]. Moreover, CVDs do not only impact the health, quality of life, and general well-being of patients, but also burden the individual and his/her family financially [4]. These may also lead to the underdevelopment of the family and consequently lead to financial burden and re-channeling of state resources. This may result in financial toxicity. Financial toxicity can be described as healthcare-related at the patient level and state expenditure related to provision of medical care and improving quality of life of patients. State experiences more financial costs due to rising medication costs [10]. The primary healthcare facilities which provide care to outpatients must emphasize more on these behavioral interventions as cost-effective strategy to curb cardiovascular diseases.

2. Cardiovascular diseases as public health concern

World Health Organization (WHO) reported that CVDs are the leading cause of death globally. In 2019 alone, approximately 17.9 million deaths associated with CVDs were reported, which constitute 32% of all global deaths. Around 85% or four in five CVDs deaths are due to heart attack and stroke [1]. However, in high-income countries, 80% of cardiovascular deaths are due to myocardial infarctions and strokes [11]. One-third of these deaths occur prematurely in patients diagnosed with CVDs and are under the age of 70 years. Many cases of cardiovascular diseases (about 80%) are mainly reported in low- and middle-income countries with higher mortality [1]. The burden and prevalence of CVDs are expected to increase considering the lifestyle and urbanization.

One million deaths due to CVDs were sub-Saharan Africa alone, resulting in 5.5% of all global and 11.3% of all CVDs deaths in the world and Africa,

respectively [12]. Cardiovascular diseases are the leading cause of death among non-communicable diseases, with about 38% of all non-communicable disease-related deaths in Africa due to CVDs. These are approximately twofold increase of CVD deaths since 1990, with over 10% difference in mortality among women compared with men [13]. Moreover, in South Africa, 215 persons die daily due to heart diseases or strokes, while every hour 5 and 10 persons die due to heart attacks and stroke, respectively [14].

3. Urbanization

Urbanization involves the mass migration of persons from rural to urban area and/or urbanization. Historically, urbanization was associated with human development and progress; however, recently it is associated with significant inequalities and health problems [15]. Some of the major health problems resulting from urbanization include poor nutrition, pollution-related health conditions and communicable diseases, poor sanitation and housing conditions, and related health conditions. All these challenges have an impact on quality of life, health status, and overall well-being resulting in the necessity for more cost of care burdening the public purse [15, 16]. Conversely, rural areas have been progressively urbanized and realizing similar health challenges. In Africa, the rural people have due to urbanization abandoned the traditional way of living including healthy eating and physical activity [17]. Reports show that incidences of cardiovascular diseases began to increase with increasing urbanization in Africa [17]. As such, there is a need to encourage communities to embrace urbanization, emulate good things it brings, and at the same time restore the way of life which was more beneficial to their health.

Obesity is most prevalent in urban areas and has become public health problem, particularly because obesity is associated with CVDs [18]. However, obesity is also increasing in rural areas due to urbanization, hence the increase of prevalence of CVDs and its death rates. Obesity threat is increasing because of unhealthy behaviors such as increased physical inactivity, and consumption of fatty food, and sugar intake [15].

4. Primary healthcare facilities

The Primary Health Care (PHC) facilities as the first health service visited by patients/public with a health concern and serves mainly outpatients [19]. The PHC intends to promote attainment by all people of a level of health that will permit them to live socially and economically productive lives. Accordingly, PHC is essential, scientifically sound, ethical, accessible, equitable, affordable, and accountable to the community [20]. Therefore, it is important that a clear collaboration with communities and family of patients is established for improved health outcomes and curbing of cardiovascular diseases. Healthcare providers at primary healthcare facilities are therefore expected to provide cardiovascular diseases awareness, treatment, and preventative care [20]. Preventative healthcare is cost-effective; therefore, it is necessary for PHC providers to be well-equipped through in-service training with preventative healthcare to minimize the cost of care and improve health outcomes of patients [21]. Moreover, healthcare providers must at each consultation sessions with patients emphasize more on behavioural change in relation to physical activity, healthy eating,

and alcohol and tobacco use [22]. These interventions have been found to be cost-effective and assist in the management of cardiovascular diseases.

5. Collaborations with family and communities

Collaboration is about working together to achieve a particular purpose; in this context working together to achieve improved health outcomes using cost-effective interventions. The components of collaborations include openness, focus, accountability, and knowledge sharing [23]. Collaboration in health care is defined as professionals assuming complementary roles and cooperatively working together, sharing responsibility for problem-solving and making decisions to formulate and carry out plans for patient care [23]. Collaboration is about teamwork, which when applied in health care implies interdisciplinary approach. Unlike a multidisciplinary approach, in which each team member is responsible only for the improved healthcare collaboration has been cited as a key strategy for healthcare reform [24]. So far, collaboration in health care improved patient outcomes such as reducing preventable adverse drug reactions, decreasing morbidity and mortality rates, and optimizing medication dosages [23]. In addition, teamwork is beneficial to healthcare providers by reducing extra work and increasing job satisfaction [23]. Most of the care of outpatients takes place where they reside; therefore, there is a need for health care to collaborate with family members and communities for improved outcomes using cost-effective strategies.

Figure 1 shows the collaboration of communities and families of patients in providing an appropriate care.

5.1 Collaboration with families

Family is regarded as the most important source of social support and is tightly related with self-care activities and improved health outcomes [25]. Since most of the patients with heart failure live with other family members at home, participation and support of family members can play a key role in self-care behaviors and efficiency of disease control, as shown in **Figure 1**. Therefore, family can influence a patient's

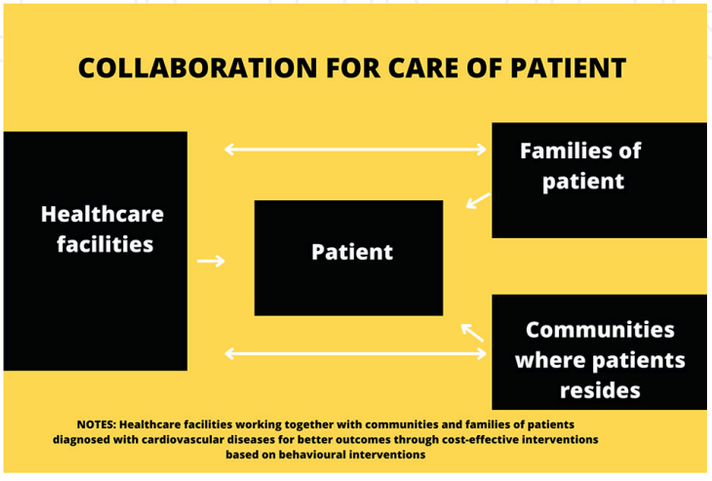

Figure 1.
Collaborating in the care of patient.

success and stability of their behavior change in self-care programs. Several studies revealed the association between family support and heart failure patients' self-care [26, 27]. Earlier studies showed that patients with more support had better compliance of self-care health behaviors. Adherence to self-care behaviors such as restricting fluid intake, regular medication, and exercise are associated with patients with social or family support [28]. It has been found that the level of family support was directly associated with adherence to dietary modification and other dimensions of self-care in heart failure patients [29].

Family members, who provide support at home, were found to have inadequate knowledge regarding management of disease, its signs and treatment [29]. In addition, they were found not to have knowledge on how best to support and encourage patients to follow self-care behaviors [29]. Therefore, the support from families with inadequate knowledge may be harmful and lead to poor health outcomes [30]. Hence, collaboration of primary healthcare providers with family in the care of patients is significant [31] and can close identified knowledge gap. In addition, the primary healthcare providers could play a significant role in support, education, counseling, and taking care of patients diagnosed with cardiovascular diseases and their caregivers or family members [32]. The collaboration can help in familiarizing family members of patients' necessary behavioral changes to equip them to act as a knowledgeable and capable source of family-focused nursing at home where most care happen [32]. It has been reported that effective behavioral changes require baseline line analysis to gain insight into family dynamics and mutual interdependence of the family system [33]. Interventions which target family members, caregivers, and children, encourage communication among family unit, and address the structural and environmental conditions in which families live and operate, are likely to be the most effective approach to promote cardiovascular health [33]. Therefore, there is a need for the adoption of the family-centered care approach.

Family-centered care (FCC) is considered as an approach of responding to the needs, values, and cultural needs of the patient and their families [32] and begins from consultation at the healthcare facility involving healthcare professionals, patients, and family members, being involved in decision-making and shared leadership [31]. Family members are often asked to share responsibility in support of the person living with diabetes; this responsibility includes driving patients to appointments, and social and emotional support, among others. The FCC has so far produced better outcomes in younger children who are usually cared for by their parents or families, since younger children are unable to perform certain tasks related to self-care [34]. The aim of the FCC is to maintain and strengthen family bond and roles so as to provide healthy family functioning, and at the same time improving the quality of life (QoL) of patients, as well as minimizing new cases involving family members who are already at risk due to family history [35].

5.2 Collaboration with communities

Collaboration with communities was found to be essential and cornerstones of efforts to improve public health [36]. A community can be regarded as the social and political networks that link individuals, community organizations, and leaders [37]. Therefore, it is critical to understand these networks in planning engagements with communities. The purpose of community engagement is to build trust, enlist new resources and allies, create better communication, and improve overall health outcomes [37, 38]. The importance of collaboration with communities derives from

acknowledgment that lifestyle, behaviors, and the incidence of illness are all shaped by social and physical environments [38]. Community engagement and mobilization have been critical in addressing smoking cessation, obesity, cancer, heart disease, and other health concerns [37, 38]. Community awareness campaigns or intervention which involves communities during planning were essential in identification of most pertinent health issues as well as to design the most effective and appropriate strategies to solve them [39]. **Figure 1** indicates that working together with all stakeholders within communities is required to effectively change environmental and organizational conditions that promote rather that inhibit healthy lifestyles [36].

A community collaboration that considers the behavioral risks of associated with increased chances of development of CVD has the potential to improve access to health checks [37]. These could be an effective strategy for improved implementation and uptake of health checks leading to early detection and management of CVDs. Community engagement is defined as the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations, to address issues affecting the well-being of those people [37]. A review on community engagement interventions was conducted and the findings showed that it is effective in improving health behaviors, health consequences, and psychological outcomes [40].

It has been found that a healthy community has well-connected, interdependent sectors that share responsibility for recognizing and resolving problems, including enhancing its well-being [40]. Effective and successful community interventions are based on integration, collaboration, and coordination of resources from all parts [40]. Health can be impacted by social factors; therefore, it is significant to engage stakeholders within the communities who can bring their own perspectives and understandings of community life and health issues to help in developing an intervention [38].

6. Behavioral change

Behavioral change is the process of altering habits and behaviors for particular purpose [41]. Behaviors can be highly ingrained and turn into habits which are done without thinking. It has been found that little changes in behavior can lead to significant health improvement and life expectancy of patients by decreasing the negative impact of unhealthy behaviors [42]. Behavior change is influenced by number of factors including knowledge and attitudes which are important determinants of behavior change [43]. It has been found that education programs that contain behavior change approaches are extra effective in changing behavior [44]. Behavior change is a complex process which requires theoretical foundation during planning any behavioral intervention program [45]. Theory enables greater understanding of the relationships among factors that influence behavior change [46].

They must work jointly with patients in designing health goals, eliminating barriers to adopting a healthy lifestyle, and tracking their own behavior can be beneficial [46]. Healthcare providers regularly see patients who engage in unhealthy lifestyle behaviors; therefore, healthcare providers particularly at the primary healthcare facilities must be equipped with skills to encourage patients change their behaviors [45].

6.1 Goal setting for health

Goal setting is regarded as an essential intervention for patients intending to change behaviors [44]. Healthcare providers particularly at primary healthcare facilities should help patients visualize the does and do not for the successful attainment of their health goals [44]. In doing so, they must work together with patients in designing health goals and eliminating barriers to adopting a healthy lifestyle. Identification of barriers will enable development of possible solutions and ultimately in achieving improved clinical outcomes. The healthcare providers can use "SMART' acronym goal setting strategy to encourage patients to realize their goal setting; the acronym stands for [44]:

Specific: Encourage patients to get as specific as possible about their goals. For instance, if patients want to lose weight, he/she must indicate how much weight he/she wants to lose.

Measurable: Ensure that the goal set is measurable. For example, exercise for 30 minutes, 3 days a week.

Attainable: Make sure patients' goals are feasible; for example, the patients wanting to exercise daily but working far from home can be encouraged to wake up early for exercise or late after coming from work.

Relevant: Ensure that the goal is relevant to the patient. Why does the person want to make this change? How will this change improve his or her life?

Timely: Help patients define a specific timeline for the goal. When do they want to reach their goal? When will you follow-up with them? For instance, helping patients set a goal to lose 10 kilograms (kg) in the next month may feel less overwhelming than a goal of losing 5 kg in the next year.

7. Attitude of patients

Attitudes of patients are significant to behavioral change and assumes an enormous importance with positivity in attitude becoming an absolute necessity [31]. Attitude is regarded as positive/negative behaviors an individual acquires through experience. It is significant to alter false perceptions and attitudes toward cardiovascular diseases to help individuals develop positive attitudes [47]. It has been found that individuals' perception and attitudes toward the disease influence how they deal with it [47]. According to Muchiri, Gericke, and Rheeder [48], attitudes are considered as the most important determinants of behavior change among patients. It is therefore important that patients must have positive attitudes toward cardiovascular diseases, particularly behavioral change interventions.

8. Self-monitoring of behavior change program

Self-monitoring refers to regular keeping or tracking of components of behavior; for example, patients who intend to lose weight could keep track of daily minutes of exercise undertaken [49]. It is important to encourage patients to keep diaries of their behaviors so that they could relay progress in the subsequent or follow-up consultation [44]. It may be difficult for patients to remember their activities or behavior during follow-up visit if they are not recorded leading to inaccurate and invaluable. The moment patients agree to be on behavioral intervention and monitor their

behavior, it becomes essential for healthcare providers to emphasize on the specifics of the plan. For example, the patient wants to monitor the physical activity behavioral intervention and discuss when during the day he/she can exercise. How will the patient remember to observe and record the behavior? Recording the behavior soon after its occurrence led to accurate data [44]. Although patients may be tempted to omit unhealthy behaviors or exaggerate healthy ones, healthcare providers should encourage patients to be completely honest to maximize the usefulness of their self-monitoring program. For self-monitoring to be most effective, healthcare providers should ask patients to bring their self-monitoring book to follow-up visits. These will help in reviewing the behavior together with patients celebrate successes, discuss challenges, and co-create plans for next steps. The process of consistently tracking one's behavior is sometimes an intervention itself, with patients often sharing that it created self-reflection and resulted in some changes [50].

9. Conclusion

This study acknowledges that cardiovascular diseases are costly to manage and that its prevalence is increasing daily and threatening the health budget. Therefore, the cost-effective interventions target behaviors such as: (1) cessation of tobacco use, (2) avoidance of alcohol abuse, (3) regular physical activity, (4) healthy eating, and (5) reduction of salt. The adoption of these behavioral interventions is associated with reduced costs burden and improved outcomes among patients diagnosed with cardiovascular diseases. Health policies that create conducive environments for making healthy choices affordable and available are essential for motivating people to adopt and sustain healthy behaviors. In the implementation of cost-effective behavioral change interventions, it is important that primary healthcare providers help patients through SMART acronym and also help patients visualize what they need to do to reach their goals through the use of SMART acronym strategy. Attitudes of patients toward the behavior change and the self-monitoring program are crucial for better outcomes of cost-effective interventions to curb cardiovascular diseases.

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