Factors Influencing Community Health Workers' Preparedness for ICT

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Contributor: Lilies Ratshidi, Sara Grobbelaar, Adele Botha

Globally, community health workers (CHWs) are increasingly viewed as an integral part of the health system as opposed to simply being an extension of it. Given this view, most low- or middle-income countries (LMICs) have refocused their efforts on reorganising CHW initiatives to maximise their impact. In 2011, the South African Department of Health formally integrated community health workers (CHWs) into the national health system to strengthen primary healthcare delivery following the Universal Health Coverage (UHC) principles and the South African National Development Plan 2030. Several studies have found that most CHWs are comfortable providing clinical treatment but are unsure how to translate epidemiological and socio-demographic data into relevant information for service delivery. Information and communication technology (ICT) provides a viable mechanism for assisting CHWs with information appropriation.

Keywords: community health workers ; health information systems ; resource-constrained environments ; contextual factors ; Sub-Saharan Africa ; South Africa ; social systems ; community health systems ; ICT

1. Health Systems' Practices

Several studies have alluded that a functional health system relies on appropriately assigning roles and establishing good working relationships between CHWs and other healthcare professionals. Furthermore, these are regarded as essential components that can influence the receptibility of interventions in the view of community health workers (CHWs) [1][2][3][4][5]. According to Assegaai and Schneider [6], the quality of the relationships between CHWs and the official health system has a significant impact on their work ethic and practices. Although most CHW programmes have formal health supervisors who advise and direct them, in practice, their leadership is not always effective. Schneider and Nxumalo [7] found that CHWs in the Western Cape and North West provinces were seldom recognised as autonomous health agents. According to [8], professional support and good relationships between CHWs and other healthcare professionals were found to be important in enhancing CHWs' competencies; however, a lack thereof led to CHWs solidifying their mistrust of the major players in the health system, resulting in CHWs receiving minimal recognition within their communities and enhancing the indifference of CHWs toward their role clarification and motivation to perform effectively. In addition, inadequate organisational support and the perception of CHWs as extensions to be exploited by the broader health system contribute to the immobilisation of the health system. In [4], the issue of CHWs' lack of professional certification and insufficient incentives for CHWs relative to other employment opportunities are discussed; furthermore, this issue is attributed to being a barrier to the scale-up and sustainability of implementation interventions [9][10][11].

Most CHWs are overburdened by assuming team-leading roles and overseeing ward-based outreach teams' work [6]. The evidence shows that power dynamics in health systems and community expectations sometimes play a role in persuading CHWs to execute practices that may be beyond their area of expertise or job description [12][13]. The following are recognised as important subcomponents to consider in health systems' practises to guarantee the effectiveness of the implementation of information and communication technology (ICT) interventions: [9][14]; support-capacity building [15]; interpersonal support [15][16]; workplace support [15][17]; accountability through proper management systems [7][18][19]; formal authority for decision making [20][21]; and standard tools for the adequate moderation of performance [3][6]. The lack of systematic approaches to integrating CHWs into the healthcare resource pool [20]; corruption [22][23]; ill-treatment and belittlement [23][24]; managerial carelessness and indiscretion in the administration of CHWs [7][18]; and contradicting role assignments lead to their dissatisfaction [12]. The facilitating or hindering factors are categorised under the following subconcepts: appropriate allocation of responsibilities and roles; workforce determination; leadership and governance; health workforce relationships; programme design; and development of appropriate systems.

2. Health Systems' Policies

This concept includes factors categorised under three subconcepts: the first subconcept is human resources policies, which is concerned with aspects of working conditions, incentives, training, and career perspectives. The second subconcept is policy formation, which includes factors influencing policy creation and development. The last category is political commitment and climate, which is concerned with aspects of political and social commitments. The study found that, in most developing contexts, the rights of CHWs were not officially covered owing to a lack of policy development, which resulted in insufficient support for CHWs and limited their capacity to function within the health system and in their communities. Furthermore, due to the lack of various regulations, employment prospects for CHWs are fragmented, and there are no defined processes for authorising CHW roles and tasks. According to [4][5][21], policy implementation entails integrating CHWs into the health system as well as into human resource strategic planning to claim that the functionality of the health system, particularly the state-owned sector, is impacted by CHW performance.

Ndima et al. [5] added that the fragmented health system and inadequate policy coordination are essential factors to the rigidity within the verticalised information flow and governance. As a result, Cometto et al. [25] provide valuable suggestions for using a whole-systems approach, which entails harmonising and aggregating the aims, context, and design of the local health system through policies to match with the national health system. Kok et al. [4] discovered that, although most nations have national health policies that encompass CHWs, there is no comprehensive policy specific to CHWs. A lack of policy leads to insufficient support and the inability to work and receive help in their communities, which, in turn, leads to little acknowledgement from healthcare and community-based system stakeholders [9][26][27]. Policies regarding vulnerable populations and the steps for effectively addressing their needs through CHWs while considering their language, culture, literacy, and community development are more specific [6][18][28][29]. Furthermore, according to several scholars [20][23][30], interest groups tend to compel developing countries to adopt developed countries' health policies to further international agendas and interpersonal interests. Such practice occasionally does not comply with statutory provisions or complement developing countries' contextual environments.

Other studies [17][31] even go as far as suggesting penalties for such organisations as an appropriate punishment to defend the government's capacity to sustain the enactment of national regulations and the execution of health programs. It is widely acknowledged that sophisticated systems and tactics may be prohibitively expensive for impoverished countries due to public health underfunding and a reliance on donors [17]. However, there is evidence to show that the failure of ICT health interventions is caused by the lack of policy directives that address issues such as the misappropriation of funds and lack of accountability and that parastatal programmes through which national health expenditures are administered are corrupt [7]. These impede the ability of the health system to implement ICT-related policies for CHWs [32]. Because of this, the reviews [12][32][33] suggest taking into account the preconditions of the community, the political commitment, and the social conditions of the CHW human resource pool to strengthen the development of appropriate CHW-related policies and the implementation of ICT interventions. These suggestions can help to figure out how social factors can be used to influence and inform policy development.

3. Education and Training

Training and redesigning training programmes for appropriateness enable CHWs to be equipped with the appropriate skills and attitudes to increase the success of ICT uptake. Therefore, this concept accounts for factors related to organisational input towards enabling CHWs with ICT; educating, training, and certifying their training; restructuring their organisation and workplace design; developing training strategies to allow for continuous improvements and the adoption of context-specific training skills; and accounting for the influence of predisposing factors such as the social and cultural norms that influence how CHWs may perceive learning. However, there remains a knowledge vacuum on how to promote large-scale intervention implementation and sustain the expanding roles of CHWs effectively. According to Ndima et al. [5], CHWs should receive proper training and support using the same human resource management approaches as other health professionals. In the same way, their training should include ongoing skills and knowledge development [1], refresher training [1][13], continuous real-time feedback [9], and frequent performance evaluations [5][14][34] to improve their skills.

Oliver et al. [21] argue that to qualify CHWs properly, they should undergo refresher training regularly. According to Tseng et al. [18], training for CHWs should focus on aspects that are important in their jobs, such as health promotion, prevention, and screening. As a result, their training must change simultaneously to meet the health demands that necessitate a regularly updated training curriculum and administrative techniques to link the greater range of their community's health needs [29][33][35][36]. Geldsetzer et al. [37] advise that the desired training comprises three key features: first, they should be instructed to expand their knowledge and abilities in areas that were not addressed in earlier training; second, they must

develop creative training approaches that are appropriate to their changing contexts; and third, they should include training to adequately handle patients who may not fall within the specified tasks of the individual CHWs. The majority of training programmes do not cover technological literacy; thus, it is essential that the training includes technological enablement [16] as well as change management skills to enable CHWs to adjust quickly to change, anticipate possible channels, and diagnose and treat underlying problems that fall within their scope [1][38][39]. Adequate training and technical knowledge were discovered to be optimal performance characteristics, particularly for CHWs who are likely to conduct activities that necessitate the use of ICT solutions, which necessitate technical expertise and superior managerial support [40].

4. Competency-Based Task/Role Assignment

This concept is concerned with the portfolio of CHW tasks concerning understanding, defining, and characterising their roles for specific tasks to achieve measurable outcomes; in addition, hiring model considerations is another subconcept with factors concerning the process of recruiting and professionalising CHWs based on their core competencies, training, and scope of practice. Most review studies that assess CHWs' roles and capacities reveal that the load, complexity, and range of functions that CHWs perform vary substantially according to context-specific needs and opportunities. Similarly, the studies generated lists of activities identified as the core tasks, including health focus areas for CHWs. Some of the significant health focus areas include neonatal, antenatal, child and maternal care, and infectious and non-communicable diseases [3][18][21][23][41][42]. As a result, CHWs engage in a comprehensive range of activities that are categorised under similar focal health issues such as health promotion and prevention.

Remarkably, a review by Topp et al. [32] notes that the expansion in CHWs' roles harms their performance; considerably, CHWs are likely to succeed when their roles are clearly defined with a limited scope of work practices. Mohajer and Singh [12] state that the hierarchical bureaucracy within the health system does not account for the social capital and reciprocal relationships between CHWs and their communities. As a result, their social position and lack of authority weaken their effectiveness and ability to advocate for strengthened governance [29]. In addition, it is pivotal to note that the responsibilities of CHWs are not binary eccentricities but operate relatively along a continuous spectrum where some CHWs assume broader responsibilities, whereas others have limited responsibilities. The type of role dictates the responsibilities/scope of practice and the required competency. In most cases, the role assignment was based on the experience of CHWs and perceptions by supervisors and facility managers, as there are no nationally recognised standards for role assignment [43]. The range of health system functions includes clinical care services, utilisation of health services, education, research in collecting and reporting data, mediation between social and health systems, and psychosocial support [44][45].

5. Economic Context

The economic context is concerned with macroeconomic and microeconomic factors that are categorised depending on their impact on CHWs as people and the financial sustainability of the ICT implementation efforts. According to research conducted by Kok et al. [26], incentives significantly impact the performance of CHWs. Although there is an expanding body of literature that documents the impact of the economic context, the evidence is primarily based on understanding the relationship between incentives and motivation with the intent of improving CHW performance. CHWs in most developing countries are expected to start as volunteers without job security or assured future employment pathways. Inadvertently, some of them ultimately move through a programme that allows them to receive incentives such as fixed salaries, regular allowances or stipends, performance-based compensation, material incentives, training, supplies, and preferential treatment from superiors [7][30]. Consequently, the mechanisms that can be used to holistically contextualise CHWs' preferences to ensure their satisfaction and economic security are often not realised. As a result, the widespread consensus is that, notwithstanding the socioeconomic gaps, the value of CHWs in the primary healthcare sector can be potentially profitable provided they are suitably incentivised and equipped with the appropriate skills [8][44][46].

In addition, Ngugi et al. [13] suggest that in most resource-constrained environments, the lack of basic monetary incentives to supplement CHWs' income negatively influences their attrition and retention rates as well as their willingness to learn and adopt new skills; this significantly affects their health and welfare. Ultimately, improving their service quality because of their intrinsic desire to serve their community does not preclude their desire for employment, family, and social support. Income and community safety play a critical role in the health services delivered by CHWs, particularly within the South African community, where it is documented that CHWs who do not receive external rewards show exceptional attrition [4][33]. Additional studies [3][17][47] assert that the possibility of promotion, the provision of welfare facilities; incentive mechanisms; equality between health professions; and the range and scope of CHWs' assigned activities have the potential to improve the work environment for CHWs [46][48].

6. Environmental Context

Within the environmental concept, factors related to the social and physical environment as well as the work environment of CHWs are of primary concern. CHWs find themselves straddling two cultural zones in which on the one hand, they fulfil clinical tasks within communities and on the other hand, they are answerable to the health system that wants to recognise them as part of its workforce [29][32]. Therefore, understanding the factors influencing their working environment is critical. Factors related to successful governance strategies, organisational culture, and structure, as well as available resources within the environment, must be considered to create a conducive environment for ICT implementation and use. As a result, the physical circumstances of the community, the health systems' structures, and the CHW organisational programmes' characteristics must be considered from a macrosociological standpoint. Another body of research [4][49] considered CHWs in healthcare from a micro-sociological standpoint, focusing on the interactions between CHWs, their neighbourhoods, and their social and health behaviours and outcomes. However, there are very few details about how the dynamic relationships and interactions among CHWs are shaped by the environment in which they and their work structure are embedded. Grant et al. [50] recognise the complexity and distinctiveness of the context in which CHWs work, adding that their interpersonal ties put their secrecy to the test because they are both members of the community and service providers. Other research takes a more elaborative approach, defining the environment as a geographical region within which members interact.

Geldsetzer et al. [30] state that the proximity of households to CHWs' health facilities and climatic changes play major roles in the utilisation of CHWs by their communities, postulating that households within one to three kilometres are less likely to utilise CHWs' services compared to households within one kilometre of a CHW facility [26][30]. Even when proximity is accounted for, the key determining factor is the comfort, trust, and perceived confidentiality of the patient to work with the recommended CHW since the consent of both parties is obtained before they are linked [18][37][51]. Given their lack of equipment and training, their incapacity to perform their duties jeopardises their potential to strengthen ties between their community and healthcare institutions [8][33][34]. Due to their limited training, they inevitably fail to distinguish between the professional environment they are expected to work in and how to manoeuvre it in a developing setting such as South Africa, which becomes an even more formidable obstacle [13]. The work environment has a significant impact on CHWs' satisfaction, which can be attributed to a system-wide misunderstanding of their roles, particularly regarding cultural congruence and the overlapping responsibilities of multiple community health systems [8][20][28][47][52]. The factors relevant to this concept are categorised under the following subconcepts: community conditions, CHW capabilities, strategies for successful leadership and governance, resources, organisational culture, and structure [53].

7. Safety and Security

Ensuring access and control to data security and emergency services is emphasised in studies, whereas factors related to the assurance of individual safety are deemed of high relevance as most CHWs find themselves vulnerable to issues related to job security and personal safety in their communities [4]. Moreover, creating management support systems to ensure that CHWs have protective guidelines for managing their workloads and achieving occupational safety is important. Most resource-constrained environments have concerns about crime and violence; therefore, having ICT solutions that integrate with the span of the location and ensure measures for the navigability of the vicinity is essential. Kok et al. [26] elaborated on the concept of personal safety and security for CHWs in LMICs and concluded that a lack of security interferes with CHW service provision and contributes to CHW attrition. Furthermore, compensation, job security, and working conditions are potential constraints that may influence CHWs' propensity to carry out their jobs effectively.

Reduced productivity and service quality are attributed to a lack of safety and security and ultimately affect the efficiency of community-based programs. Kambarami et al. [13] propose profiling CHWs using structural and social aspects and ensuring control over their work location. Increased access to provider networks and emergency services plays a significant role in influencing CHWs' determination to perform and could potentially motivate them to adopt and use ICT effectively when there are considerable benefits. However, in multi-tiered contexts where crime and violence are pervasive, the perception of a lack of personal safety interferes with their capacity to offer their services. Furthermore, their safety as citizens of communities and constituents of the healthcare workforce, with their work systems integrated into the community, could place them in the path of violence [28]. As a result, the dynamics of their community's conditions provide significant barriers to their individuality and a risk to their employment.

8. Community-Based Learning and Development

The early involvement of communities in implementation projects has been deemed a key to the success of ICT implementation. However, it is not always easy to communicate the correct information, especially in environments where

the social structures do not permit the easy adoption and acceptance of new systems. Therefore, several aspects can help to determine the types of information and strategies to employ for maximum cooperation. These include understanding the enabling conditions, how the community's participation, engagement, level of knowledge, and education will inform the implementation process, and the typical strategies to employ when approaching a community based on their level of understanding. This understanding would minimise the difficulties in engaging with community stakeholders and understanding the community's social structures and prevailing perceptions. The objective of the community development effort is to improve the livelihoods of marginalised societies in a way that is compatible with the historical context of social work from a macrolevel perspective [54].

Community development and community-based approaches should focus on enabling access to health care, considering the community's belief systems towards health issues, and effectively availing information about health behaviour to empower societies [18][55][56]. The perspective is supported by the notion that enhancing a community's ability to identify problems and needs, organising and supporting social change strategies, and accepting social change propositions lie at the heart of community empowerment [10]. In this way, the acceptance of health services delivered through ICT solutions by CHWs is influenced by the community's level of knowledge and their interest in social engagement [14][21][50]. As a result, to enhance community-based learning and development, there is a need to include the following factors from the literature that contribute to community responsiveness: community involvement; community utilisation of CHWs; community knowledge of CHW roles; the negation of community intervention; understanding of CHW intervention; intensification of incommunicable or non-communicable disease patients; augmented adherence to medication per catchment area; knowledge of preventive procedures; and conservational community management [3][17][29][41].

9. Socio-Cultural Contexts

Most ICT implementation interventions in healthcare have adopted a purely technical method, which presumes that social interactions and perceptions will not evoke any latent resistance. However, reality deems it essential to focus on understanding how CHWs view their employment from a socio-cultural perspective, and how they view their contextual environment and community structure including their cultural beliefs, patriarchal structures, and gender roles. Another essential point to consider is that of gender roles [37][41]. Most LMICs allow specific antenatal and maternal care tasks to be performed only by female CHWs because of cultural beliefs and values systems. As a result, social- and gender-based values produce shadowing processes that impact the processes and responses of CHWs, necessitating consideration in implementing ICT health interventions [53][57]. Most male CHWs' mobility is limited, particularly in Middle Eastern, Asian, and African nations, where cultural and religious conventions influence and shape interactions between males and females [12].

A major proportion of CHWs are required to volunteer while serving and living in disadvantaged communities where they are vulnerable to structural poverty and inequities [58]. This raises another overarching concern for CHWs: the impact of employment stability on their social status. From an individual standpoint, offering their labour without financial incentives and security can have a negative effect on their participation and engagement in their communities. CHWs are required to provide healthcare services in communities where they frequently resemble the people they serve. Such resemblances may exist in terms of social and cultural characteristics such as political ideologies, traditional and religious beliefs, language or demographic factors, conditions or needs, shared lived experiences, common understandings, and usually from living in the same location [12][16][32][59]. The extent to which CHWs' demographic attributes differ from their communities is relevant [4][16]. Furthermore, although most CHWs are sociable with cultural and community awareness, the vast majority have little or no prior experience navigating local health systems.

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