Reflections on an engaged research approach to understanding patient record-keeping systems in a local clinic in Makhanda

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Abstract

The taking and archiving of accurate record-keeping is an essential part of caregiving in health care. There is extensive evidence that record-keeping systems are affected by systemic problems which impact healthcare provision globally, and South Africa is no exception, particularly in public healthcare. Human Factors and Ergonomics has been applied in studies of healthcare settings to address these systemic challenges, including those related to record-keeping, but not in South Africa. Given that Human Factors and Ergonomics advocates for a participatory approach, a community-based participatory research framework can be used to understand and optimise systems such as those linked to record-keeping. This reflection provides an overview of how a Human Factors and Ergonomics approach was applied, using a community-based participatory research framework, to understand the challenges affecting patient record-keeping in a clinic in Makhanda. Specifically, it provides insights into how community-based participatory research was applied, as well as reflections on this experience from both the researchers' and collaborators' perspectives. The importance of patience and flexibility, empathy, constant feedback and consultation and listening to collaborators' and participants' contributions emerged as important lessons. The community collaborator found the process to be positive and reflected that being able to help guide and facilitate research was an empowering experience, which, in turn, revealed challenges that affected the daily running of the clinic. The collaboration using the community-based participatory research approach was a practical and inclusive framework for applying several Human Factors and Ergonomics approaches to understand the challenges around record-keeping.

Keywords: *community-based participatory research, human factors and ergonomics, patient record-keeping, healthcare, reflection*

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Introduction

Providing safe, effective, and timely care to patients in healthcare systems requires accurate patient records to be taken and maintained, in addition to many other factors (Berger & Scott, n.d.). However, globally, as well as locally in South Africa and specifically noted by these researchers in the city of Makhanda, patient record-keeping activities are associated with high workloads for clinicians, which can result in inaccurate or lost records, ultimately affecting the provision of ongoing care (Marutha & Ngoepe, 2017; Pirkle et al., 2012). Additional challenges include insufficient time to retrieve and complete patient records, an excessive burden of work, healthcare staff demotivation, inadequate access to record-keeping materials such as forms and stationery, a high number of patient admissions, and a shortage of staff (Bizimana & Bimerew, 2021; Luthuli & Kalusopa, 2018). Many of these challenges emanate from the overall design of healthcare systems. It is important, therefore, to interrogate the design of these systems and how they influence the work of clinicians.

As a discipline which focuses on understanding and optimizing human-system interaction, Human Factors and Ergonomics (HFE) is well placed to understand and help address any emergent challenges with record-keeping processes (Blijleven et al., 2017; Khunlertkit & Paine, 2015) while acknowledging the broader context in which this work occurs (Dul et al., 2012). In understanding the challenges present in any system it can be useful to adopt a participatory research approach, in which members of the community in focus are involved in the research or problem-solving process from its inception to its completion (Schmittdiel et al., 2010). This research approach challenges more traditional, Western-based methods of research and knowledge generation and contributes to decoloniality in the research process (Nhemachena, Mlambo and Kaundjua, 2016; Omodan and Datile, 2023). It is argued by Omodan and Datile (2023) that the participatory research approach is an effective and valuable tool in achieving decoloniality through the research process, because it allows for the research subjects to have input into the process, their voices are acknowledged and recognised, and they are provided with a platformthat promotes agency and self-determination. These elements, therefore, resonate with the decolonial agenda to deconstruct oppressive power structures and remembering those who have been historically dismembered by systems of colonial occupation. Participatory research can be achieved by adopting a community-based participatory research (CBPR) approach (DeJonckheere et al., 2019; Minkler, 2005; Telleria, 2021).

Aim of this reflective paper

Internationally, successful interventions have been applied to healthcare record-keeping systems across various settings (Bunting & de Klerk, 2022; Glen et al., 2015; Goveia et al., 2013; Homb et al., 2014; Mahomed & Asmall, 2015; Okaisu et al., 2014; Pezaro & Lilley, 2015; Tola et al., 2017). However, little to no research has applied HFE through a

CBPR paradigm to understand record-keeping in a South African context. Therefore, this paper explores, in a reflective manner, the process of adopting a participatory approach when applying HFE to understand record-keeping challenges in a local clinic in Makhanda, South Africa. There is also little guidance on how to carry out CBPR in situ. Therefore, the secondary aim of this paper is to provide an overview of the process followed in applying CBPR to a local healthcare clinic record-keeping process. Critical reflections and important lessons learned during the implementation of CBPR are presented by both the researchers and the community collaborator.

Literature Review and Background

Patient Record-Keeping

Patient record-keeping is an essential process in healthcare systems, as a way to store and collect important patient information such as demographics, progress notes, vital signs and medical histories. Due to the essential nature of patient record-keeping, the importance of good quality records and the barriers to accurate record-keeping will now be explored.

Good quality records

The information contained in medical records is necessary for healthcare professionals to make critical clinical decisions around patient care (Ohuabunwa et al., 2016; Wong & Bradley, 2009). Additionally, these records are medico-legal documents that support patient management, continuity and quality of care, and provide evidential support to healthcare professionals and institutions during litigation (Britz, 2018). Therefore, records must be accurately and sufficiently completed, given their value in the provision of safe and effective care (Mutshatshi et al., 2018).

Globally, and more locally in South Africa, good patient record management is often neither prioritised nor even possible under the constraints of the healthcare system (Marutha & Ngoepe, 2017; Wong & Bradley, 2009). This lack of prioritization decreases the accuracy of patient records, meaning that records could contain erroneous information, be incomplete, or be of poor quality (Wong & Bradley, 2009). The safety and quality of current and future patient care can therefore be threatened by poor record-keeping (Pirkle et al., 2012). An example of inadequately managed patient records is the loss of patient records, which are reported to be as high as one in every seven records in the case of hospitals across Limpopo, South Africa (Marutha & Ngoepe, 2017). Incidences of incomplete or lost records increase the demands on healthcare staff and their decision-making, and therefore, may impact patient care and potentially affect patient's lives (Bizimana & Bimerew, 2021; Marutha & Ngoepe, 2017).

Barriers to record-keeping

Healthcare professionals face many barriers to accurate and good-quality record-keeping (Wegner, 2013). The two categories of record-keeping barriers are charting barriers, relating to recording patient information, and archiving barriers, relating to issues around the retrieval of charts and records (Pirkle et al., 2012). Some common record-keeping challenges include poor handwriting, lack of documentation, missing information, miseducation regarding the importance of medical records, replication of patient numbers, lost records, information recorded on scraps of paper which are never transferred to proper records, and poor, disorganized archiving (Pirkle et al., 2012).

In a South African context, various authors have reported several factors that impact the record-keeping processes (Bizimana & Bimerew, 2021; Luthuli & Kalusopa, 2018; Marutha & Ngoepe, 2017; Mutshatshi et al., 2018). Clinicians report having insufficient time to complete or retrieve records. This is likely exacerbated by clinician workload, where staff shortages and high patient numbers increase time pressure. Additionally, several storage and filing-related challenges have been reported, where facilities do not have a designated filing system and poor infrastructure, resulting in inappropriate handling of records, problems locating files, and the damage, loss, or theft of records. Another common challenge is a lack of budget for record-keeping materials (Bizimana & Bimerew, 2021; Luthuli & Kalusopa, 2018; Mutshatshi et al., 2018). From an organisational perspective, poor leadership and staff management, as well as a lack of training, often result in poor management of records, demotivated staff, inconsistency of record completion and poor staff buy-in (Bizimana & Bimerew, 2021; Luthuli & Kalusopa, 2018).

Given the impact of various systemic challenges on the record-keeping process, a systems discipline such as Human Factors and Ergonomics (HFE) is well placed to begin to understand and improve the systems around record-keeping.

Human Factors and Ergonomics (HFE)

The International Ergonomics Association (IEA) defines Human Factors and Ergonomics (HFE) as "The scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design to optimise human well-being and overall system performance." (IEA, 2000, (https://iea.cc/about/what-is-ergonomics/). From this definition, three fundamental characteristics of HFE need to be expounded.

The first characteristic is that HFE takes a systems approach by acknowledging and accounting for all the interacting components that contribute to a system and how it functions (Dul et al., 2012). For example, various components exist and interact with one another within a working system, which is closely related to the concept of interdependence discussed later in this article under participatory research. These components can include the people performing certain tasks using specific tools and under different organizational, physical, and social conditions, as demonstrated in the System Engineering for Patient Safety

(SEIPS) model and its various components (Carayon, 2006). The second key concept of HFE is that it is design-driven and aims to optimize work through system design or re-design. In other words, this refers to designing systems before their implementation, or creating change in the environment or workplace to suit workers to improve performance and well-being rather than changing people to suit the work (Dul et al., 2012). This underscores the point that people are central to the HFE discipline and emphasises that system redesign must be user-centred. The third focus of HFE is the need to optimise interactions between people and systems to maximise performance, safety and well-being outcomes for people within the system (Dul et al., 2012). Capturing these three fundamental principles is the application of HFE in practice, where it has been and continues to be applied in the design of healthcare systems to improve performance and safety and reduce healthcare costs, thereby improving the system for both patients and clinicians (Aceves-González et al., 2021; Hignett et al., 2013). This can be achieved by taking a systems view and a human-centred design approach to improve healthcare safety (Norris, 2012).

Over and above these high-level principles that characterise the approach and intended outcomes of HFE, Wilson (2014, pp.5-13) provides additional clarity by outlining six notions that define and characterise good HFE, which provide guidance on what human-system interaction is, and how to understand it. We have already highlighted that HFE adopts a systems focus, which Wilson extends by arguing for the importance of adopting the first notion of a *system* framework (discussed in more detail in Thatcher and Yeow, 2016). Briefly, this refers to the importance of appreciating the nested nature of systems, and how macro-level (organisational) factors influence meso-level (team dynamics and performance), which in turn impact the individual people (workers) at the micro level (Karsh et al., 2014). Appreciating the nested nature of systems allows for interventions to be developed at appropriate levels in the system. The second notion is the importance of understanding the *context* of interactions between people and the systems around them, which is best understood in Wilson's words as 'in the wild' (Wilson, 2014, p.7). Thus, understanding systems and the impact of the context in which they exist is essential when trying to understand how the *interactions* (the third notion) between system components (humans using technology to work in an environment) influence the well-being and performance of people. To understand the effects of human-system interactions, HFE must adopt a *holistic* approach in which people's physical, cognitive and social characteristics are monitored before and after any form of intervention (Wilson, 2014). For the fifth notion, *emergence*, Wilson argues for the importance of observing the emergent outcomes of how systems are designed, which often reveals unexpected outcomes, innovative workarounds by humans to poorly designed systems or new human-system interactions not imagined by the designers. Lastly, Wilson contends that to be able to understand the interactions occurring between humans and the systems in context, *embedding (spending time)* in that context is vital to solving or designing for solving system problems. These notions guide the approach of HFE specialists to understanding human system interaction thoroughly. However, to do so, adopting a participatory approach is critical.

Given the human-centred approach to design in HFE, adopting a participatory approach is necessary to understand and redesign a system for the optimal performance and well-being of workers within a system (Burgess-Limerick, 2018; Shepherd et al., 2020). Participation in system design or redesign using an HFE approach involves workers and/or those performing tasks in the identification and solution development of existing challenges, as well as the development and implementation of appropriate, co-constructed changes in the workplace. The aim of these changes is to improve productivity, reduce risk factors and ultimately achieve desirable workplace goals (Burgess-Limerick, 2018).

Participatory research

Characterisation and Benefits of Participatory Research

Participatory research is an action-based research paradigm whereby researchers actively and meaningfully involve and collaborate with system stakeholders representing the studied population or the community in focus to address community issues (Key et al., 2019; Vaughn & Jacquez, 2020). The community can be defined as a group of members affected by a common issue, who share common attributes and space, and work towards a common goal (Schmittdiel et al., 2010). Identifying and collaborating with relevant members of the community is an essential step towards fully understanding the challenges they experience and how, through collaboration, these challenges can be overcome so that meaningful and sustainable change can occur (Costa-Black & Arteberry, 2020; Mayosi & Benatar, 2014). Adopting such research methods continues to challenge predominating Western/Euro-centric approaches to knowledge acquisition and generation by, as Omodan and Dastile (2023) argue, dismantling power structures, giving agency to the partnering communities and legitimising their knowledge and experiences towards promoting the democratisation of knowledge generation.

Within participatory research, several approaches can be adopted to facilitate community engagement and participation (Vaughn & Jacquez, 2020). Participation and engagement in this context have overlapping definitions, which refer to the inclusion of and communication with community members. These can range from being informed by a community to research being driven by a community (Vaughn & Jacquez, 2020). While a review of the different methodologies is beyond the scope of this paper, some of these include action research, participatory action research, team science and user-centred design research (refer to Vaughn & Jacquez, 2020 for more details). Each of these forms of engagement with the community in the research process falls into a continuum of community engagement research, ranging from having the community participate in research programs that are largely researcher-driven, to the community being collaborators or equal partners in research rather than being only research participants, to the research being owned and driven by the community (Brown, 2022; Key et al., 2019). No one form of community engaged research is better than another (Key et al., 2019). However, it is critical that participation and engagement are not superficial and that full and active participation

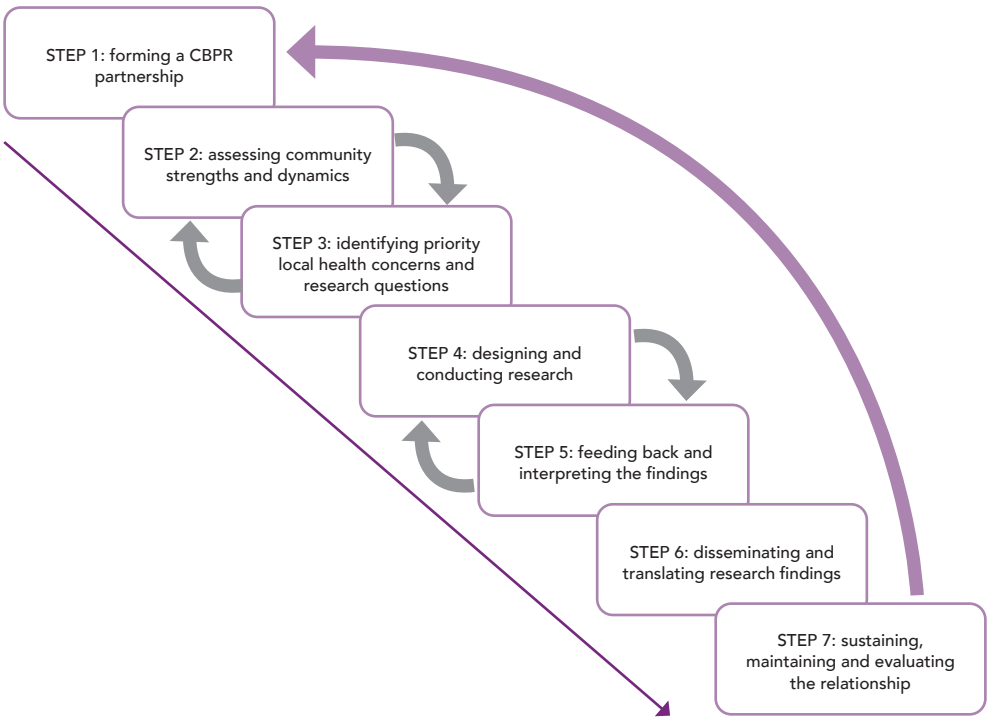
is both valued and utilised throughout an engaged research process (Martinez-Vargas, 2022).

Participatory approaches in research can yield several benefits, such as addressing specific challenges outlined by the community and enhancing real-world knowledge, experience and capacity for researchers and communities, which are likely to create actionable and sustainable solutions to challenges (Bourke, 2009; Vaughn & Jacquez, 2020). Importantly, adopting a participatory approach requires interdependence, with interactions and reliance between system components and between researchers and community members in the co-creation of knowledge (Wallerstein et al., 2005). This aligns well with the systems focus of HFE, where consideration is made for the interaction between all system components and how these interactions impact system outcomes. In a working context, involving workers (and other relevant stakeholder groups) early in the process has resulted in the development and implementation of changes in the workplace, which in turn has resulted in improved productivity, reduced risk factors and achieving desirable workplace goals (Burgess-Limerick, 2018; Haines et al., 2002; Van Eerd et al., 2010).

Community-Based Participatory Research (CBPR)

A common participatory research framework often used is community-based participatory research (CBPR). This is defined not as a method but rather as an orientation toward research that can use a combination of qualitative or quantitative methods (Minkler, 2005) and in some instances, indigenous research methods (Drawson et al., 2017), to understand, ideate about and eventually address challenges with a community. When adopting this orientation towards research it is particularly important to involve people with lived experiences in the community and with the challenges at hand (Corrigan & Oppenheim, 2024). This involvement is important in the identification of challenges and inequalities and, importantly, how they may be addressed (Corrigan & Oppenheim, 2024). There are four core principles of CBPR as described by Schmittdiel et al. (2010): i) researchers should engage with the community in all phases of the research process, ii) researchers should build on a community's existing resources and goals, iii) researchers should invest in sustainable long-term partnerships and iv) the research process should take place through a cyclical and iterative process. A guideline of steps that can be followed when embarking on CBPR is outlined by Israel et al. (2013) (Figure 1), starting with forming a partnership and ending with sustaining, evaluating and maintaining the partnership.

Figure 1: Steps to follow when conducting CBPR, adapted from Israel et al. (2013) with arrows representing the iterative nature of the approach



This process requires more than just tokenistic involvement of the community in the identification, solution development and implementation. As Telleria, (2021, p.459) argues, adopting this approach ensures that research is conducted "by the people, for the people" and not "for the people, by the experts". This ensures that the research process is sensitive to any contextual or cultural nuances that may impede the research, which Minkler (2005) calls cultural humility. In addition, approaching the engagement with what Dalymiya (2007, p.297) refers to as 'relational humility' as a basis for interacting with the community emphasises that researchers need to acknowledge and embrace the fact that they do not have exclusive power of knowledge and can and should work together with the community and utilise their knowledge and insights to co-create new knowledge and understanding (Dalymiya, 2007). These humble interactions are essential to balancing real or perceived power dynamics, which empowers the community to take ownership of the project and appropriately guide the research team. This type of attitude also enables a community to look for ways to drive their own self-improvement, based on their interactions with the research team.

A synthesis of paradigms: HFE and CPBR

HFE, by its nature, is a human-centred, systems-focused discipline used in the attempt to optimise human-system interactions by adopting a participatory approach that often involves embedding in a system, with the ultimate intention of improving human performance and wellbeing. Although HFE has a long history of adopting participatory approaches in practice, few researchers have applied a CBPR framework in a context such as healthcare. CBPR provides a way of collectively understanding challenges while giving agency to 'the researched' (Omodan and Dastile, 2023), allowing them self-determination over how research is conducted with them. The synergies between HFE as a discipline and CBPR, an approach or orientation to working with humans, provide a clear argument for extending HFE approaches by integrating CBPR. In this study, it was applied to understand the barriers and facilitators to effective record-keeping in a local clinic in Makhanda.

The city of Makhanda

Before unpacking the approach taken in applying CBPR in a local Makhanda clinic, it is important to contextualise the history of the city and its socio-economic position today. Makhanda, previously known as Grahamstown, is a small city in the Eastern Cape province of South Africa, rich in history (Heshu, 2020; Irvine, 2021). The land that is now Makhanda and its surrounds was inhabited by local people for many years before the town was officially established in 1812 and grew with the arrival of the 1820 settlers (Heshu, 2020; Irvine, 2021). Since the arrival of the British settlers, the city has transformed through colonialism, the post-colonial period and into the apartheid regime which formally segregated people (Heshu 2020; Irvine, 2021). Now, 30 years post-apartheid and 30 years into democracy, the extent of social, economic and spatial changes remain problematic and the city is still shaped by its historical roots (Irvine, 2021). Challenges defining the city today include issues of structural unemployment and inequality, water scarcity, extensive potholes, poor service delivery and municipal corruption (Heshu, 2021; Irvine, 2021).

Approach to applying Community-Based Participatory Research (CBPR) in a clinic in Makhanda

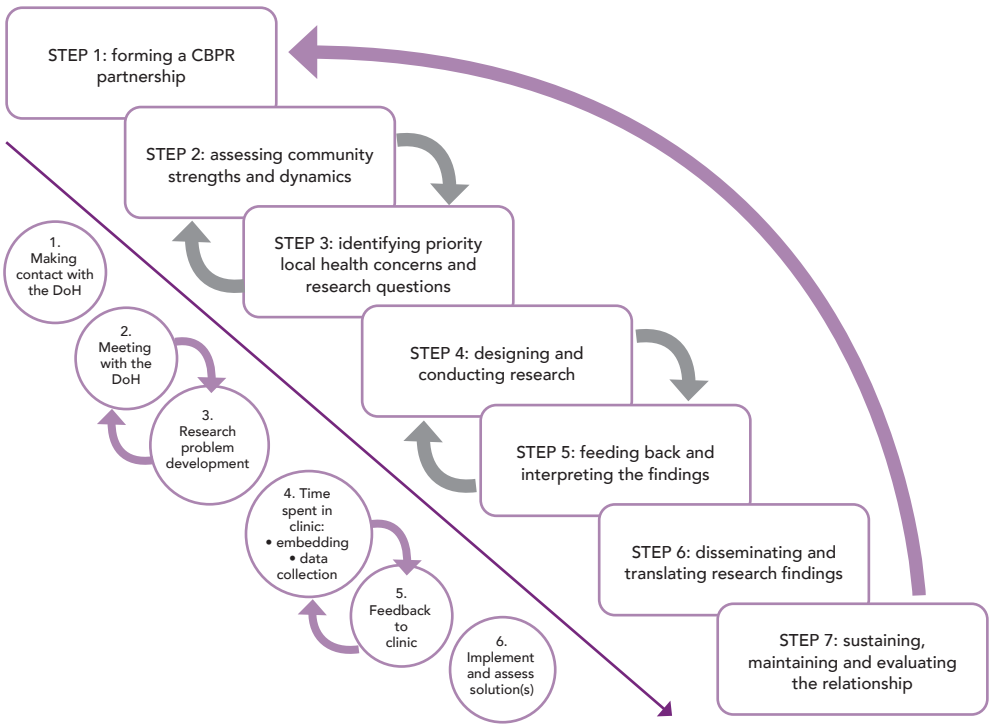
Using the guidelines outlined by Israel et al (2013) (Figure 2), this section provides a brief overview of the approaches adopted in this study to holistically understand the tasks associated with the patient record-keeping process and the various systemic factors which influence it as part of the care provision process. Following this framework as a guideline in the research process, enabled researchers to consider the views of others and consider how to undertake the research process in collaboration with community members. A crucial part of applying CBPR and understanding the clinic record-keeping system was having the researchers work closely with a community collaborator whose role was to guide the researchers through each step of the research process. The community collaborator in this study was a clinic staff member (SP) appointed as a lay counsellor. SP worked closely with

all other staff members. Additionally, their enthusiastic nature and love of working with people led the facility manager to suggest that they work with the researchers during the research process. The community collaborator guided researchers in practical ways when working with other staff members and assisted with continuous feedback. While we cannot share any of the study's findings yet due to constraints as per the ethical agreement with the Department of Health, we (the research team and community collaborator) offer some critical reflections on the experience of applying CBPR.

Forming the relationship: Making contact and meeting with the DoH

The researchers (JD and AT) had an existing research collaboration with the local Department of Health office (DoH), which originated before the COVID-19 pandemic. This research focused on understanding the systemic barriers to the provision of effective healthcare across several clinics surrounding Makhanda. Based on this research and more recent discussions between the researchers (JD and AT), the student researcher (KK) and the connection at the DoH, various areas of possible research were explored through several meetings. Areas of concern discussed included the patient record system, which led to the involvement of the facility manager of the clinic in which this research occurred.

Figure 2: Steps to follow when conducting CBPR (adapted from Israel et al. (2013)) with the addition of practical steps in the circles below.



Research problem development

Steps two and three (Figure 2) took place through an iterative cycle, whereby after each meeting the KK would consult literature around challenges discussed at meetings and discuss this with the supervisors (JD and AT) before attending the next meeting. Through this iterative process and discussions regarding all the challenges faced in local primary healthcare clinics, the record-keeping system was highlighted as a persistent area of concern to the DoH. This was a critical step towards the co-construction of an actual, tangible challenge experienced by the Department and not one that the researcher imposed upon them. This led to the collective decision that the research collaboration should be centred on the record-keeping element of the clinic's work. The final meeting with the facility manager confirmed record-keeping as a challenge within her facility.

The initial step in preparing for the research collaboration with the clinic was to elect a community collaborator from the clinic whose role it was to guide KK through each element of the research. When KK approached the facility manager regarding the election of a community collaborator, the manager immediately suggested the above-mentioned individual. SP was consulted and agreed to work with KK. The collaborator's role would change throughout the data collection process but would be primarily related to assisting KK in making decisions about how best to go about the research process, how and when to approach clinical and support staff, interpretation of data and assisting with feedback and clarification of findings at the end of data collection.

Conducting the research

Embedding

In order to understand the context, system, interactions within the system and emergent outcomes one needs to take a systems approach by embedding within the system (time spent in the clinic to familiarise oneself, build trust and become part of the given system), as suggested by Wilson (2014). At the start of the embedding process KK attended a clinic staff meeting first to confirm that clinic staff indeed found record-keeping to be a challenge in their clinic and to explain what the research would be about. This also served as an excellent opportunity to gauge the staff's willingness to participate in the study and to listen to any insights or questions they had. The purpose of being embedded and spending time in the clinic, both before the official start and during data collection, was for KK to become familiar with and understand the clinic system and, more importantly, to build trust with clinic staff.

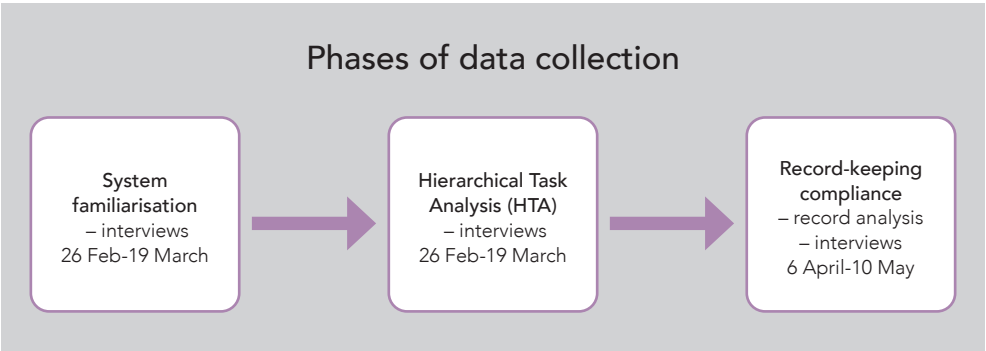
For the three months spent embedding, KK would go into the clinic for two or three hours a day, three times a week, and in all a total of 35 hours was spent in the clinic. During this time, KK sat in the reception area conversing with staff, asking questions and observing how things were done. The community collaborator (SP) also taught KK how to retrieve files from the cabinets, and during very busy times KK helped retrieve and deliver files to

clinicians and thereby obtained first-hand experience of the work associated with patient record-keeping.

Data collection

Once ethical clearance was obtained from Rhodes University (tracking number: 2023-7391-8094) and the Department of Health, official data collection could begin. Data collection occurred over four months in three overarching phases, as displayed in Figure 3.

Figure 3: *Phases of data collection from February to May 2024*



Phase one consisted of observations, discussions and semi-structured interviews on the various components of the clinic system and how they interact to form the system. This included understanding the people, tasks, tools and technologies, organisation, environment and outcomes, and how these different system elements interacted with and influenced the record-keeping system. A total of 10 interviews (nine individual interviews and one combined interview) were conducted with 11 staff members including clinicians, pharmacy assistants, the administrative clerk, a lay counsellor and the facility manager (Figure 3, Block 1). Phase One and Phase two interviews were combined to reflect information on the components of the clinic system and more specifically details regarding the tasks and processes involved in the record-keeping process. The process of record-keeping and the tasks involved in record-keeping were presented in a Hierarchical Task Analysis (HTA), where different steps or tasks associated with the process of record-keeping were placed in a hierarchical organisation in relation to the goal (Figure 3, Block 2). Doing so helped participants to visualise what steps should be followed during a task if done correctly, which could then be compared to how it is performed in reality (Shepherd & Stammers, 2005).

Phase three included two parts, firstly, the analysis of 55 patient files, where a frequency count was conducted on what information clinicians filled in or omitted within different sections of different types of patient files (Figure 3, block 3). This analysis was compared to a national checklist of what should be completed in a patient file. The second

part of Phase three involved understanding the findings of the frequency count and staff perceptions regarding why certain patient file sections were or were not adequately completed. This was done by conducting semi-structured interviews and reviewing a blank patient file with three clinicians and capturing their experiences and insights around what they generally fill out in patient files and why.

The importance of constant and transparent feedback with community partners

During this study, feedback on the research findings was given in various ways. The first was continual feedback from clinic staff throughout the research process and during interviews, as well as from the community collaborator and other staff members. This ensured that what was observed and reported by the student researcher was an accurate representation of their lived experiences of their work. This emphasises the importance of consultation and clarity-seeking throughout the data collection process. At the time of writing this manuscript, data collection and analysis had just been completed.

Critical reflections on CBPR implementation

Reflections from the researchers

The process of applying an HFE systems methodology using a community-based participatory approach yielded several important insights, which are given here as reflections from the researchers (JD, AT and KK). Key insights were the importance of being patient and flexible, listening carefully, having empathy and appreciation for the constraints that staff work under, and providing regular feedback and consultation with staff during the research process. Some reflections from the researchers on working with the community collaborator conclude this section.

Patience and flexibility

Through conducting CBPR, a valuable lesson learnt was the importance of patience and flexibility. Many staff members were happy and willing to work with the research team. However, the clinic continued running, and as such, staff members had tasks to complete which necessarily interfered with data collection. For example, during interviews some staff members, particularly those in administrative roles, continued to work on their operational tasks. During interviews, another staff member would often knock and walk into the room to ask a question of the person being interviewed. Sometimes when an interview was conducted over the telephone, other staff members would need to use the same phone simultaneously. These factors meant that interviews were often interrupted.

Patience was also required given that staff members often did not have the time to have a conversation or interview or had to postpone a scheduled interview. This occurred for various reasons, including the clinic being understaffed on certain days, the clinic being

extremely busy, clinicians not being in on the day of a scheduled interview or staff members taking days off due to family emergencies. Often, patience was required when KK arrived at the clinic and could not speak to anyone.

These experiences are described in literature as what Minkler (2005) refers to as 'constraints on community involvement' where it is often the case that the individuals one works with cannot give up their time and energy due to operational constraints. Ironically, in the case of this study, the constraints limiting individuals' time given to the research were some of the limitations being understood through the research. The researchers viewed this as a positive point, as it shed further light on the constraints the clinic staff faced and gave the researchers an appreciation for the work of clinic staff under these constraints, as will be discussed. Rosen (2023) mentions that throughout a research project the pace or enthusiasm from the community may fluctuate depending on various factors, and this phenomenon emerged in this study. This demonstrates the emergent and dynamic nature of the work studied, and the system's design should reflect this and be equally as flexible.

Listening

While listening is generally important when working with people, it was found to be essential when applying CBPR in the interactions with the various levels of stakeholders, from the study's inception to the completion of data collection. There are two main reasons for this. Firstly, feeling heard and having someone willing to listen and care about their work and perspective instilled a willingness in the clinic staff to continue working together during the research process. This speaks to the iterative cycle of listening, dialogue, action, re-listening and reflection on action, as discussed by Parajón et al. (2021). It is also an important step towards empowering the community, in this case, the clinic staff, to co-construct knowledge and possible solutions with the research team through trust building (DeJonckheere et al., 2019; Telleria, 2021). In this research project, trust building was done through the process of listening and being responsive. However, most of the trust built between the student researcher and clinic staff was during the embedding process, where the clinic staff and KK became comfortable working together and sharing information in the clinic space.

Secondly, even if participants did not answer exactly what was being asked, particularly in interviews, it was important to listen and note what participants said. When trying to understand how the design of a system affects their work and well-being, any insights provided by workers are valuable for several reasons. Firstly, as outsiders looking in, researchers may make assumptions about challenges within a system and not even ask the right questions. The interaction between the researchers and staff in this study opened up a space for them to share. Secondly, often responses did not reflect the challenges, and rather focused on potential solutions. This speaks deeply to the notion of taking a systems approach, understanding the context of a system and the impact of this context, looking for, or in this case listening for emergent challenges and suggested improvements and seeing the clinic staff holistically, as advocated for by Wilson (2014). It also emphasises

the utility of this participatory methodology, which facilitates the opening of space for research participants to share openly and honestly, which is an important step towards the co-construction of solutions.

Empathy and appreciation

During the research process, the constraints and affordances under which the clinic staff work, became more apparent. Additionally, it became evident that several systemic challenges beyond their control impacted their ability to provide effective and efficient care. These challenges included time-related, workload-related, budget, broken or lacking equipment and infrastructure, and space-related constraints. In addition, most work spaces in the clinic are too small for the population they serve. All of these challenges, unfortunately, are common problems faced across the public healthcare sector in South Africa and globally (Bizimana & Bimerew, 2021; Luthuli & Kalusopa, 2018; Marutha & Ngoepe, 2017; Mutshatshi et al., 2018). However, despite these extensive challenges the staff manage to provide primary healthcare services to the large patient population that the clinic serves. As researchers, we now appreciate the difficult work of the clinicians and the service they offer to their communities despite these challenges.

Feedback and consultation

Feedback has been crucial throughout the research process, specifically achieved through regular and transparent consultation with the clinic staff. This was important, as during interviews and discussions, feedback was obtained by clarifying whether we (the research team) accurately understood what clinic staff members were telling us, which emphasised the democratization of knowledge rather than a researcher-imposed understanding of the data being collected. Additionally, feedback was received by going back to the community collaborator and other staff members after interviews had been analysed, to ensure, for example, that the researcher had recorded an accurate representation of the record-keeping process.

Challenges around feedback and how best to share and release findings with communities are common in CBPR projects (Minkler, 2005). These challenges were addressed by continuing to communicate with the community collaborator regarding how to constructively share results with the clinic staff. Despite continuing data analysis and interpretation, it was decided that an initial feedback session was necessary. This happened over a lunch held at the clinic during their weekly meeting with all staff who were available to attend. The purpose of this meeting was two-fold, i) to give feedback on key findings from the study to clinic staff members, and ii) to discuss what staff felt were the most important findings and what they would like to be further disseminated to the DoH as part of a report based on key findings and areas for potential change. This report is now in preparation.

Reflections from the student researcher (KK)

The student researcher (KK) worked closely with the community collaborator throughout the research process and, therefore, reflected on this experience. Before unpacking these reflections, it is important to acknowledge the positionality of the student researcher, which may have unconsciously impacted each step of the research process. These imposed self-titles include but are not limited to being a white South African female from a privileged and educated background.

The first reflection explores the role of the community collaborator, how she was well positioned and how her nature was well suited to collaborating with the researchers throughout the research process.

> *While the community collaborator did not work with the files as regularly as the clinicians (as mentioned in her reflection), we did not feel this negatively influenced the research process, as her ability to work with people and guide me to the right people was immensely valuable. This highlights how well she knows the clinic, how passionate she is about the clinic and her work, and how she was always willing to help in reception or with anyone else who needed a hand. I would also like to acknowledge the facility manager here. When I approached her about having a community collaborator from the clinic staff, she had no hesitation in supporting the idea. She suggested the community collaborator chosen, due to her enthusiastic nature and ability to work with people.*

The next set of reflections explore the overall experience of adopting a participatory research approach. This includes how the approach allowed for a change in traditional research power dynamics, which highlighted some of the benefits of adopting a CBPR approach. The benefits highlighted included gaining deeper insights into the clinic system and remaining true to adopting a decolonial research approach through the engagement process.

> *In terms of power dynamics, I feel that the embedding process and building trust with clinic staff before the election of the community collaborator and official data collection allowed for reduced power dynamics. This, in turn, allowed for more honest conversations and deeper insights in discussions and interviews between clinic staff and myself, particularly with the community collaborator being honest in guiding me through the research process. I also believe these honest discussions and deep insights are reflective of the importance of adopting a CBPR approach, working closely with and being led by people from within the clinic system, the honesty, the depth of insights and the trust built would not otherwise be reflected in the results of the study. This was an important demonstration of some of the key notions of HFE, in particular, the idea that HFE cannot be done from the outside but rather only from being embedded within the system.*
>
> *I think it is also important to reflect on previous research conducted by various University faculties in the given clinic. In the clinic where I conducted the study, researchers are often referred to the clinic to conduct their research due to its high volume of patients. During the*

feedback session, the facility manager mentioned that it was often the case that researchers would enter the clinic, extract the data they needed and report back to the district office (or not at all) with the clinic staff not knowing the outcome of the research. I believe this further shows the importance of adopting a CBPR approach, working with the community and following through each step of the process, including the feedback process and, in time, the development of co-constructed solutions.

Reflections from the Community Collaborator and Facility Manager

Community Collaborator Reflections

After the data collection, the community collaborator shared both positive and negative reflections and the facility manager shared her brief reflections of working with KK in this research project. The community collaborator shared more positive reflections then negative which included themes of guiding the researcher which revealed a sense of empowerment in the community collaborator.

My first reflection point concerns the positive experience of working with the research team, where I could guide and facilitate the researchers as I know the clinic and people well. This guidance was mainly around the best times to visit the clinic, helping set up appointments with clinicians when they would have some free time, and pointing researchers to the best people to ask for feedback for specific questions or details required. I also feel like working together was a positive experience as we communicated well, facilitating the sharing of ideas. During the research process, being a collaborator and working together has helped me understand my role in the clinic better and that I like things done well and being able to oversee things. While I am not a clinician, I can be there to assist others and have weight in meetings.

Additionally, the presence of the student researcher in the clinic was well received by staff members and it was perceived that the research method allowed for challenges faced by the clinic to come to light in ways that they had not before. This was both a positive aspect of the research process, as it identified an opportunity for improvement, but had a negative aspect, as this could have created an additional burden on the clinic, given that the additional constraints identified through the research would compound existing challenges they had.

It was well received by other staff members that the researcher gave one-on-one time with many clinic staff, as shown in the feedback I have received from other staff members. The presence of the researcher and sharing ideas through the research process also allowed for the importance of record-keeping and the various elements within the process to be brought to the attention of myself and other clinic staff, as well as some of the challenges we truly face. I feel that this aspect of the research has resulted in some changes in the clinic record-keeping process. An example of this is that file retrieval in both the reception and by the antenatal care staff is now occurring more consistently than before the research.

Over and above these positive reflections, the community collaborator also shared a few difficulties she faced during the research process around her role in the process and clarity of this role. These reflections emphasise the importance of researchers being better prepared and able to communicate the expectations of the community collaborator clearly.

> *I also had some difficulties in working on this research project. Sometimes it wasn't easy to advise researchers as I do not work with files as frequently as clinicians. The final reflection, or area for future improvement, is that at the start of working together, I felt that it was not clear what was expected of me and did not always know what work to do. However, as time passed and we continued to work together, the practical side more clearly demonstrated my role as the advisor. This shows that in the future, it is important to ensure clarity at every step of the process.*

Facility Manager reflections

While we did not specifically garner reflections from all staff members on their experience of working with the researchers on this project, the facility manager shared some important reflections during the initial feedback session. One particular reflection she shared supported using CBPR as a decolonial research methodology. To this end, she indicated that the research project differed from previous research conducted in the clinic, where researchers collected data, extracted knowledge and never returned or gave feedback or outcomes to the clinic staff members. This emphasised the importance of forming a meaningful relationship before and during the research process and, critically, sharing the findings, and learning how they can be interpreted through the lens of not only the researchers, but also those from whom the data were collected.

Limitations and recommendations for future research

While several valuable lessons were learned in the application of CBPR in this study, some limitations impacted both the experience of the student researcher and the data that she could gather while working in the clinic. Firstly, the time constraints of the clinic staff, which often meant that interactions had to be brief or repeatedly rescheduled, impacted the ability to collect data. Secondly, the study results and reflections about the experience of working at this specific clinic are not generalisable to other clinics. Therefore, future research should focus on working with other clinics and record-keeping systems to gain a broader picture of primary healthcare clinic record-keeping. This is a very important step in the engagement process in that it is iterative and sustainable, demonstrating a commitment from both stakeholders (researchers JD and AT as permanent staff members) and the participants. Solutions could be co-constructed and be more widely applicable. Importantly, any research that involves communities must ensure that appropriate, timely and meaningful feedback is provided back to the community. Not doing so runs the risk

of reducing community interest in collaborating with researchers, where both parties will miss the opportunity to mutually benefit from this collaboration.

Conclusion

This paper addressed two core aims, i) demonstrating the application of CBPR and HFE together in situ and ii) sharing the experiences and reflections of applying CBPR within the local Makhanda context of a primary healthcare clinic record-keeping system. The experience of the researchers in adopting an HFE approach to understanding the challenges around record-keeping in a local clinic using a CBPR approach has revealed the synergies between CBPR and HFE. More specifically, it has emphasised the utility of integrating CBPR into the participatory HFE methods, to allow researchers to effectively elucidate the interactions between the various system components and the people involved through understanding the insights and lived experiences of those within the system. While the insights and understanding of the record-keeping system challenges cannot and have not been discussed in this paper, future researchers in the HFE or related disciplines should consider using this approach in understanding work and developing solutions to improving work. We have also highlighted three critical, practical takeaway points to close this reflective paper.

i) The CBPR approach is not an easy or linear process to follow, as the method was designed to enable working with communities to understand the challenges they face comprehensively and iteratively work with them to co-construct ways of addressing these.

ii) Patience, trust, and listening are fundamental skills to learn and implement when working with all community levels, particularly when identifying emergent challenges or solutions.

iii) Despite not yet being at the formal feedback stage of the research process (as data collection has only recently been concluded), we have learned that bidirectional feedback and consultation at every stage of the research is crucial in conducting CBPR, to ensure that researchers gain insights into work or life as done or lived, not just life or work as they (the researchers) perceive it to be. This feedback and consultation ensure that challenges and potential solutions that can impact the lives of clinicians and patients (in this case) are co-constructed, which is more likely to result in actionable and sustainable change.

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