

ABSTRACT

Title of Dissertation: EXAMINING PRE-TRAINING INTERPERSONAL SKILLS AS A PREDICTOR OF POST-TRAINING COMPETENCE IN MENTAL HEALTH CARE AMONG LAY HEALTH WORKERS IN SOUTH AFRICA

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A worldwide shortage of mental health specialists contributes to a substantial global mental health treatment gap. Despite evidence that lay health workers (LHWs), or health workers with little formal training, can effectively deliver mental health care, LHWs vary widely in their abilities to competently deliver mental health care, which undermines the quality of care and patient safety. Prior research from both high-income and low- and middle-income countries suggests this variability may be predicted by LHW interpersonal skills, yet this relationship is little explored to date. The first aim of the current study, which uses an exploratory sequential mixed methods design, was to explore qualitative perspectives through semi-structured individual interviews ($n=20$, researchers, policymakers, NGO staff, LHWs) in Cape Town, South Africa on interpersonal skills relevant to delivery of mental health interventions by LHWs. The second aim was to quantitatively examine the preliminary effectiveness of pre-training interpersonal skills in predicting post-training competence following a mental health training among LHWs in Cape Town ($n=26$). Using a standardized LHW assessment measure adapted to the setting, two raters rated ten-minute standardized role plays conducted before and after the training for pre-training interpersonal skills and post-training competence. Qualitative findings highlight the perceived importance of and challenges with assessing interpersonal skills among

LHWs being trained in psychological intervention. Quantitative analyses did not identify any interpersonal skills as significant predictors of post-training competence. However, interpersonal skills improved during the training itself, specifically verbal communication, suggesting the potential promise of further research in this area. Recruitment of larger samples with more variable training outcomes would be important in future studies examining predictors of LHW competence. Further research may ultimately help identify areas of intervention to support more LHWs in attaining competence and can help play an important role in increasing access to psychological services globally.

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OF POST-TRAINING COMPETENCE IN MENTAL HEALTH CARE AMONG
LAY HEALTH WORKERS IN SOUTH AFRICA

by

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Dedication

There are many people to thank for their support, both professional and personal, throughout my training. First and foremost, is the entire Siyakhana-C team: Nonceba Ciya, Sibabalwe Ndamase, Yuche Jacobs, Busisiwe Beko, Bronwyn Meyers, Kristen Regenauer, and Jessica Magidson. It has been such a privilege to work on task-shared mental health research in Cape Town during my training and such a pleasure to work with each and every one of you. To my committee, thank you for such helpful feedback, which has helped refine and enrich my thinking on this topic. To Jess and the broader GMAP lab, it has been wonderful to be a part of such a supportive, nimble, and expanding group over the past five years. Mary, it feels so lucky to have gotten to be your lab “twin.” And Sam, thank you for being the best third cohort mate Mary or I could have ever asked for. To my family – Mom, Dad, Anna, Jamie, Mugga, Ross, Edie, thank you for being endlessly supportive throughout the years as I have discovered and pursued my interests, both close by and far away. To Andy Henderson, you are the best – thank you for going through a “second” PhD. And Rocky, thank you for purring supportively next to me as I wrote this.

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List of Abbreviations

LHWs	Lay Health Workers
CHWs	Community Health Workers
LMICs	Low- and Middle-Income Countries
HIV	Human Immunodeficiency Virus
WHO	World Health Organization
HICs	High-Income Countries
RCT	Randomized Controlled Trial
NGO	Non-governmental Organization
ENACT	ENHancing Assessment of Common Therapeutic Factors
SDS	Social Distance Scale
UNICEF	United Nations Children's Fund

Chapter 1: Introduction

Research comparing the existing health workforce specializing in mental health to the mental health burden of disease across 144 countries reveals an estimated shortage of 1.7 million full-time equivalent mental health providers, with the bulk of this shortage in low- and middle-income countries (LMICs; Bruckner et al., 2011; Scheffler et al., 2011; World Health Organization, 2018). In South Africa for example, there is a lifetime prevalence of approximately 30% for any anxiety, mood, externalizing, or substance disorder (Kessler et al., 2009). However, there are only 1.52 psychiatrists per 100,000 population and data is not available on the number of psychologists per 100,000 population (World Health Organization, 2017). Across all low and lower-middle countries, there are an estimated 0.06-0.51 psychiatrists and 0.05-0.26 psychologists per 100,000 population (World Health Organization, 2017). As a result of this discrepancy between burden of disease and available specialist workforce, there is a substantial gap between those needing and those receiving mental health treatment globally, which is referred to as the “mental health treatment gap” (Semrau et al., 2015). A mental health treatment gap exists across all countries, including the United States (IHS Markit, 2018). However, the mental health treatment gap is most substantial in LMICs, where it ranges between 76 and 90% (Patel et al., 2010). Among those who do receive care, quality care is limited, with only an estimated 3.7% of people accessing depression treatment in LMICs accessing care following evidence based guidelines (Thornicroft et al., 2017). Thus, research is needed to develop and implement strategies for expanding access to quality mental health services worldwide, particularly in LMICs.

Task-sharing to close the mental health treatment gap

“Task-sharing” mental health care to lay health workers (LHWs), or health workers with little formal training, can help close the mental health treatment gap. Task-sharing is the distribution of tasks within the health workforce such that non-specialist providers take on responsibilities previously delivered by specialists, such as delivering psychological interventions under the supervision of more highly specialized providers (Orkin et al., 2021). Task-sharing, originally referred to as “task-shifting” was originally developed in response to the Human Immunodeficiency Virus (HIV) epidemic to expand access to much needed health care and is now widely used within low-resource health systems (World Health Organization, 2008). Conceptual models of task-sharing have identified a number of multi-level systems inputs necessary to support task-sharing, such as funding, governance, technical support, and policies (Naimoli et al., 2014). Moreover, researchers have identified contextual and systems interventions to help support LHWs in effectively taking on task-shared responsibilities (Ballard & Montgomery, 2017; Caulfield et al., 2019; Kok, Dieleman, et al., 2015; Kok, Kane, et al., 2015; Scott et al., 2018). More recently, in recognition of the significant mental health treatment gap, task-sharing has been extended to mental health care (Hoeft et al., 2018) and the integration of mental health with other health interventions (e.g., maternal health, HIV care) (Andersen et al., 2018; Magidson et al., 2021; Prom et al., 2022). Overall, research has demonstrated the effectiveness of task-sharing mental health care across a range of LMIC settings. A recent systematic review and individual patient data meta-analysis across 11 randomized controlled trials conducted in LMICs found greater symptom reduction among participants in task-shared psychological interventions

than control conditions (Karyotaki et al., 2022). Studies in LMICs have also found that task-shared mental health intervention delivery is cost-effective (Healey et al., 2022), and in some cases as cost-effective as specialist care (Hanlon et al., 2022). There is also evidence that some patients may prefer LHW psychological interventionists over more highly specialized providers for the delivery of behavioral health services, perceiving them to be more relatable (Magidson et al., 2019).

Individual variability in task-shared mental health care

To deliver effective health care, it is necessary to be competent, or knowledgeable and skillful, in the necessary tasks involved in the care. Within mental health care, competencies and competence frameworks have been established among specialists and are used in the training of mental health providers (Fairburn & Cooper, 2011; Kauth et al., 2010). Similarly, competencies commensurate with the standard five- to ten-day didactic and role play based trainings provided to LHWs have been developed for task-shared mental health care (Kohrt, Jordans, et al., 2015). Originally developed in Nepal, these competencies, which include interpersonal skills (nonverbal communication, verbal communication, rapport building, and empathy/warmth) and competencies of mental health care (e.g., assessing suicidality, exploring family support, explaining confidentiality) have now been adapted to many LMIC settings to ensure cultural validity and are being disseminated by the World Health Organization (WHO) (Kohrt et al., 2020). However, researchers focused on competence have identified a core challenge with task-sharing mental health care, which is that individual LHWs attain highly variable levels of skill with these competencies using standardized task-shared mental health trainings. In a study in

Nepal, LHWs attained, on average, only 66% (range: 38-100%) of the competencies needed to deliver mental health care (Kohrt et al., 2019). In a study in South Africa, 50% of LHWs were eliminated by the end of a task-shared mental health training due to lack of competence (Rotheram-Borus et al., 2015). In a study in India, only 26% of LHWs in a mental health training were certified as competent (Singla et al., 2014). Such variability in competence outcomes has critical implications for the effectiveness and quality of task-shared care, as well as patient safety, and may undermine efforts to increase very limited funding for mental health service development globally (Liese et al., 2019).

With an understanding of what predicts LHW competence in task-shared mental health care, implementers could tailor trainings to better meet the needs of all trainees. For example, it may be appropriate to make task-shared mental health trainings longer and consider alternative topics for training and alternative supervision models. It is also possible that some trainees may be better suited to other roles than task-shared mental health care. However, prediction of competence in task-shared mental health is, as of yet, not well-studied, and there are no known tools for pre-training skills assessment of LHWs focused on mental health (Cometto et al., 2018), though prediction tools are being developed for LHWs in other specialized clinical areas (Taylor et al., 2018).

The literature on provider competence in mental health care in high-income countries (HICs)

Building from competence frameworks developed for training mental health specialists, there has been research on predicting competence and patient outcomes of mental health specialists that is important to consider when starting to explore

prediction of competence among LHWs. Though the expected competencies of mental health care will differ between specialists and task-shared trainees, important qualities for providers may overlap and the literature on specialists, which is far more established due to the longer history of formal psychological intervention in HICs, can help generate hypotheses for non-specialists. Initially, the literature in HICs focused on theoretical orientation and amount of training as predictors of competence (Herman, 1993). More recently, hypothesis-testing has turned to more personal characteristics of therapists as predictors, as well as the concepts of “working alliance,” “therapeutic alliance” or “common factors” as patient-therapist factors that cut across therapeutic interventions to influence therapy outcomes. “Working” or “therapeutic” alliance reflects not only the patient-therapist bond but also the ability of patients and therapists to work effectively on shared goals in therapy (Ardito & Rabellino, 2011; Gaston, 1990; Norcross & Lambert, 2011). “Common factors” is defined more broadly and includes not only alliance and agreement between patient and provider, but also a rationale for treatment and a structured and healing environment (Cuijpers et al., 2019). Relational, or interpersonal skills, are central not only to working/therapeutic alliance/common factors but also to the influence of these factors on therapy outcomes. In multiple studies conducted within outpatient mental health clinics in Norway, “colder” interpersonal styles of therapists were related to poorer working alliance (Hersoug et al., 2001, 2009). A meta-analysis of 57 studies examining the relationship between provider empathy and patient outcomes found that perceived empathy was a moderately strong predictor of therapy outcome; of relevance for task-shared providers, this relationship was stronger for less

experienced therapists (Elliott et al., 2011). Further, studies conducted in the United States and Germany have identified that baseline interpersonal skills of mental health specialist trainees and specialists are key predictors not only of provider competence but also of later patient mental health symptoms (Anderson et al., 2009; Schöttke et al., 2017).

Interpersonal skills as a priority predictor of competence in task-shared mental health care

Evidence from LMICs also suggests the importance of examining interpersonal skills, such as non-verbal communication, verbal communication, rapport building, and empathy, as potential predictors of competence in task-shared mental health. In a qualitative systematic review, with studies covering numerous countries including Pakistan, India, Nepal, and Zimbabwe, interpersonal skills were identified as critical to the development of competence in task-shared mental health care among LHWs (Shahmalak et al., 2019). Additionally, task-shared mental health studies often report briefly in their methods that the research team assessed interpersonal skills or that stakeholders valued strong interpersonal skills in selecting trainees, though the specific strategies utilized to do so are typically not specified (Michelson et al., 2020; Murray et al., 2014; Surjaningrum et al., 2018; Venturo-Conerly et al., 2022). Lastly, in a study in Ethiopia aiming to improve LHWs' competence in task-shared mental health, improvement in interpersonal skills preceded improvement in the other competencies of mental health care (Asher et al., 2021). Taken together, existing evidence suggests that interpersonal skills may predict competence in task-shared mental health care among LHWs, in a relationship like that that exists between interpersonal skills and competence in mental health care

among mental health specialists and specialist trainees. Moreover, interpersonal skills do not require any content knowledge on mental health, which task-shared trainees are very unlikely to have (Endale et al., 2020), are relatively easily and quickly assessed (Kohrt, Jordans, et al., 2015), and are modifiable (Asher et al., 2021; Hill et al., 2020), making them potentially a practical and useful predictor. To date, however, no known study has quantitatively examined if pre-training interpersonal skills of LHWs predict post-training competence in delivering task-shared mental health care, controlling for other factors that may influence training outcomes (Figure 1).

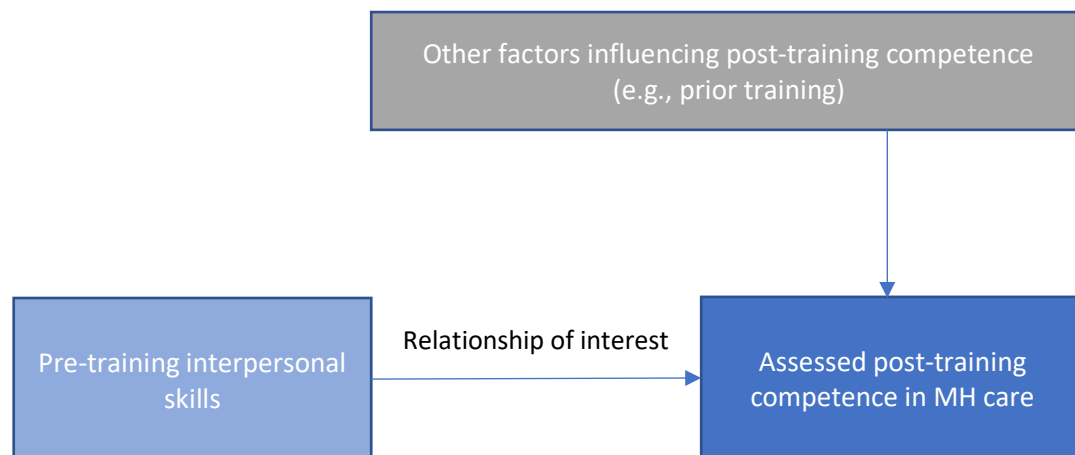


Figure 1: Conceptual model of constructs

Preliminary study

Preliminary work conducted by our team (Aim 1 of F31MH123020; PI: Rose) expands the rationale for examining the relationship between LHW interpersonal skills and competence in task-shared mental health care (Rose et al., 2023). These secondary analyses used data from a pilot cluster randomized controlled trial (RCT) conducted in Chitwan, Nepal, which examined the feasibility and acceptability of collaborating with people with lived experience of mental illness when training

LHWs in mental health services in order to reduce stigma and improve quality of clinical care (Kohrt et al., 2018, 2021).

Using random forest and logistic regression models, we explored relationships between pre-training interpersonal skills and post-training competence in a sample of LHWs trained in Chitwan ($n= 185$). Both pre-training interpersonal skills and post-training competence were assessed using standardized role play methods used widely in task-shared mental health research, and which were previously developed in Nepal by the same research team that developed competence guidelines for task-shared mental health care (Kohrt, Jordans, et al., 2015; Kohrt, Ramaiya, et al., 2015).

Findings revealed that pre-training interpersonal skills predicted post-training competence in the sample using both random forest and regression models and that the non-verbal communication item, in particular, contributed to the predictive ability of the models. Understanding stakeholder perspectives on these findings and this relationship represents an important next step, as does understanding the degree to which these findings generalize to other settings and other types of LHWs, and being better able to control for relevant covariates. Moreover, the standardized role play methods used in the pilot cluster RCT have been refined further in recent years (Kohrt et al., 2020) and there now exists an opportunity to examine the relationship between pre-training interpersonal skills and post-training competence among LHWs using more refined and potentially more precise assessment methods. These next steps are the focus of this dissertation proposal.

The context for research on task-shared mental health in South Africa

South Africa provides an ideal and timely context in which to further explore the relationships between pre-training interpersonal skills and post-training competence among LHWs. In response to the HIV epidemic, South Africa, which has the largest number of people in the world living with HIV, developed a robust infrastructure of LHWs to help expand access to HIV treatment (H. Kim et al., 2021; Mwai et al., 2013). However, South Africa also faces a substantial gap in mental health service access, shaped in large part by a lack of mental health providers (World Health Organization, 2017). In response to the need for greater access to mental health services and in light of the fact that South Africa has already attained substantial progress on international HIV treatment targets, policy makers have started to integrate components of mental health care into LHW roles and responsibilities (Centers for Disease Control and Prevention, 2019; Department of Health, Republic of South Africa, 2013). The primary type of LHW in South Africa is a community health worker (CHW). Though they receive training from the government and work to provide community-based intervention and link patients to public health facilities in alignment with government priorities, CHWs in South Africa are hired and managed by non-governmental organizations (NGOs). This introduces variation into the hiring and training procedures for CHWs and there is no systematic country or province-level training for CHWs in mental health care currently. As a result, researchers have adapted and developed psychological interventions and training materials for CHWs in South Africa with the aim of scale up (Magidson et al., 2021; Myers et al., 2018). However, though policy level buy-in is in place for integration of mental health care tasks into CHW roles and these CHW-

delivered interventions have been shown to be effective, key questions remain about how they can be delivered at scale. Central to the core implementation challenges related to delivery at scale is the fact that LHW competence varies so much in task-shared psychological interventions, and little is known about what predicts LHW competence in task-shared mental health care. With a better understanding of predictors of LHW competence, in the future it may be possible to develop selection or training strategies that NGOs and other implementers can use to tailor content to baseline trainee skill with the aim of supporting strong training outcomes and effective integration of task-shared mental health into CHW roles.

The current study

The current study uses an exploratory sequential mixed methods design in which first qualitative data are collected and analyzed to inform subsequent quantitative data collection (Fetters et al., 2013). Therefore, implications for Aim 2 are reported as part of Aim 1 results. These designs are commonly used when researchers aim to develop a new instrument or theory or examine a relationship in a new cultural context, meaning that qualitative work can help illicit new constructs of interest or important considerations for later quantitative data collection (Edmonds & Kennedy, 2023). Specifically, the current study aims to understand relationships between pre-training interpersonal skills and post-training competence in delivery of task-shared mental health care among LHWs in South Africa, about which little is directly known. To leverage existing work and local practical expertise in this under-researched area, first we explored qualitative stakeholder perspectives on the role of interpersonal skills in delivering task-shared mental health services in Cape Town,

guided by prior research on common factors from a range of settings and our team's preliminary research with LHWs in Nepal. Next, directly informed by qualitative findings from Aim 1, we quantitatively examined the relationship between pre-training interpersonal skills and post-training competence among a group of LHWs in South Africa in the context of a task-shared mental health training. We used updated role play methods for assessment and aimed to control for possible covariates that may also influence training outcomes. Please see Figure 2 for a depiction of how study aims relate to one another.

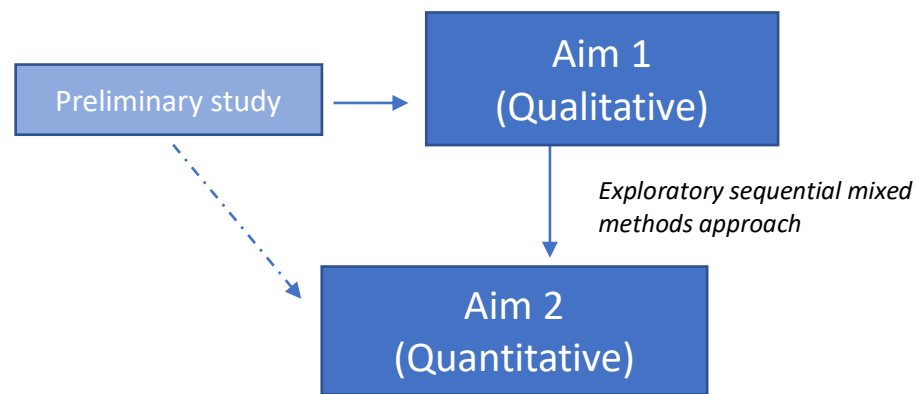


Figure 2: Relationship between study aims and between study aims and prior work

Aim 1

A therapist competence framework was used to gather and explore stakeholder feedback on the role of interpersonal skills among LHWs in South Africa in delivering task-shared mental health care.

Aim 2

We evaluated the preliminary effectiveness of overall pre-training interpersonal skills in predicting post-training competence in task-shared mental health within the context of a LHW task-shared mental health training in South Africa.

Hypothesis. Controlling for theorized covariates, we hypothesized that the total pre-training interpersonal skills score would predict the total post-training competence in task-shared mental health care score in this sample.

Exploratory hypotheses. Controlling for theorized covariates, we hypothesized that each individual pre-training interpersonal skill would predict the total post-training competence in task-shared mental health care score in this sample.

Reflexivity statement

This research took place in peri-urban Cape Town, South Africa, in areas originally developed under the apartheid government and still highly racially segregated and under-resourced. Power dynamics and racial oppression are highly relevant contextual factors within all research conducted in Cape Town. This study was led by a White American Clinical Psychology doctoral candidate who had worked in South Africa for over four years and in cross-cultural research and health care implementation in central and southern Africa for over eight years. Other team members included White senior researchers from the United States and South Africa with expertise in psychological intervention, a Black American Master of Public Health student, and Black and mixed-race South African research assistants with experience in mental health research and from the area of Cape Town in which this research took place. Though choices were ultimately made by the lead graduate student, because this was a dissertation study, efforts were continuously made throughout the process of designing and implementing this research and analyzing data to shape decisions based on input from South African research assistant team members. Throughout, we have aimed to reflect upon and explore ways in which our

personal identities were influencing our approaches and privilege the perspectives of team members with the greatest knowledge of and connection to the context.

Chapter 2: Methods

Methods and results are reported according to the Mixed Methods Article Reporting Standards (MMARS) (Levitt, 2018). Please see supplemental materials for complete MMARS table.

Aim 1

Participants and procedures

We conducted semi-structured individual interviews with stakeholders and CHWs ($n=20$) in Cape Town to explore perspectives on the role of interpersonal skills in delivering task-shared mental health services in South Africa. Interviews were conducted remotely over Microsoft Teams in English or isiXhosa and audio recorded. Audio files, stored on a secure University of Maryland server, were translated into English if needed, transcribed verbatim, and checked for quality.

Stakeholders (e.g., researchers, policy makers) and CHWs were recruited from NGO partners as part of two larger existing studies being conducted in partnership between the University of Maryland and the South African Medical Research Council. These studies aimed to reduce stigma towards mental health and substance use conditions among CHWs working in HIV care services. Within the larger studies, purposeful sampling was used to recruit participants with diverse perspectives that would help inform development of a stigma reduction intervention (Palinkas et al., 2015). Non-CHW stakeholders, who included NGO program managers, nurse supervisors, and research staff, were required to have a role that directly involved working with CHWs or within a program or service employing CHWs. Stakeholders and CHWs who participated in qualitative interviews for these

two larger studies ($N=40$) were then eligible for inclusion in Aim 1 of the current study if they were interested in conducting a further follow up interview.

Predominantly non-CHW stakeholder participants were recruited, since they may have more knowledge of selection and training practices than CHWs do. From within the original sample, $n=22$ participants were purposefully approached by telephone to ensure representation of different roles and organizations and based on the expected sample size to reach theoretical saturation (Hennink & Kaiser, 2022). Therefore, participants had in some cases met the interviewer before, in the context of a prior research interview. Two CHW managers declined to be interviewed due to lack of time in their schedule¹ and $n=20$ interviews were conducted. Participants received a 150 rand (~ 8 USD) honorarium for the interview, which took about an hour.

Approval for the study was obtained from the South African Medical Research Council Human Research Ethics Committee under an Institutional Review Board Authorization Agreement with the University of Maryland College Park Institutional Review Board. After fully explaining procedures to participants, written informed consent was obtained.

Measures

Two interview guides were developed, one tailored to CHWs and one to non-CHW stakeholders. These interview guides were informed by a therapist competence framework and a measure of LHW competence in task-shared mental health care (Kauth et al., 2010; Kohrt, Jordans, et al., 2015). Prompts asked participants open-ended questions about their own experiences as CHWs or observing CHWs

¹ The two participants who declined interviews due to workload did not noticeably differ from enrolled participants on demographics.

interacting in positive and negative ways with patients. Participants were also asked to rank specific interpersonal skills in order of importance for CHWs in Cape Town, to identify any additional interpersonal skills not listed by the interviewer, to discuss any differences they perceived in how CHWs should interact interpersonally with patients with and without mental health problems, and about other factors that could influence interpersonal skills and competence among CHWs. Lastly, stakeholder participants were shown the results of the preliminary study in Nepal and asked for their perspectives on these findings and the degree to which they applied in Cape Town. When translating and backtranslating specific interpersonal skills into isiXhosa for CHW interview guides, non-verbal communication, verbal communication, and empathy were direct translations. For rapport building, it was helpful to describe the construct with examples, as it was more challenging to translate. Please see supplemental materials for approved interview guides.

Data analysis plan

Finalized transcripts were uploaded into NVivo 12. Analysis for Aim 1 had two objectives: 1) to inductively identify information that could help contribute knowledge on a research area little studied to date in South Africa and 2) to identify findings that were relevant for Aim 2 procedures. For this reason, we used a hybrid approach to analysis. Hybrid approaches, in which deductive and inductive approaches to coding are blended, are best used when a team wants to code in line with relatively specific questions (i.e. what cultural adaptations can we make to planned Aim 2 procedures) but also wants to avoid missing any new information that may arise organically from the data (Fereday & Muir-Cochrane, 2006; Roberts et al.,

2019). First, the interview guide was used to develop an a priori codebook. Before coding began, two coders (the lead graduate student and the Master of Public Health student) reviewed several transcripts and discussed these transcripts with the larger team to identify additional ideas that emerged inductively from the transcripts and that were not already covered in the a priori codebook (Chandra & Shang, 2019). These ideas were added as codes to create the final codebook. The two coders then used a “template organizing style” described by Crabtree and Miller, in which they separately coded relatively large chunks of text of several interviews with relevant codes (Crabtree & Miller, 1999). Discrepancies were resolved through discussion between the two coders and this approach was then applied to all transcripts. Interrater agreement was calculated, with an overall kappa of 0.80 used as minimally acceptable, as recommended in the literature (McHugh, 2012). After completing coding, the two coders examined axial codes to develop a conceptual map of the codes and how they related to one another and to identify themes. Identification of themes and relationships between themes was refined using feedback from the larger team.

Implications for Aim 2. As mentioned earlier, identifying implications for Aim 2 procedures was a core goal of Aim 1 analysis. Though the main measure used in Aim 2, the ENHancing Assessment of Common Therapeutic Factors (ENACT) scale, has been previously used in Cape Town, only the original version with less detail has been used to date (Spedding et al., 2022). And interpersonal skills among LHWs have not been directly studied in this context previously. Therefore, Aim 1 findings were critical for Aim 2 preparation. With regards to the ENACT, we adapted

both included items and how scoring was operationalized. For example, if participants in Aim 1 discussed an interpersonal skill not already included in the ENACT, we created an additional exploratory item, with operationalization of different scores, to be able to assess that skill in Aim 2. We also adapted how scores were operationalized within items to better reflect the cultural environment described by Aim 1 participants. For example, if the way appropriate verbal communication was described by Aim 1 participants was not consistent with higher scores on our existing Aim 2 measure, we refined operationalization of that item's scores before using the measure. All adaptations were completed in English before translation and backtranslation of the measure.

Because of the relative dearth of literature on LHW interpersonal skills and predictors of LHW competence in task-shared mental health care, we also used qualitative interviews to identify potential additional covariates for Aim 2 data collection and analyses. Specifically, we identified constructs that participants believed, based on experience, might impact the relationship between pre-training interpersonal skills and post-training competence and that had not been identified a priori by the research team. If it was possible to extract data on these constructs from the larger study's measures, they were included in Aim 2.

Aim 2

Participants and procedures

Following completion of Aim 1, Aim 2 measures were collected at a three-day training aiming to reduce stigmatizing behaviors and improve interactions between CHWs working in HIV care services and patients with mental health and substance use conditions ($n=30$) in Cape Town, South Africa. Training content integrated

curriculum previously used in South Africa to provide education on mental health and substance use conditions (Sibeko et al., 2018) with curricula to teach interpersonal skills and the required competencies of mental health care to CHWs (i.e., asking open-ended questions, management of suicidal ideation, collaboratively setting a goal with a patient; Kohrt et al., 2019). Training was provided by trainers who had previously delivered task-shared mental health trainings to CHWs and supervised CHWs in task-shared mental health care in a combination of English and isiXhosa, as is standard for CHW trainings in Cape Town.

Like Aim 1, Aim 2 was embedded within a larger study on mental health and substance use stigma reduction among CHWs being conducted in partnership between the University of Maryland and the South African Medical Research Council. In the larger study, all interested CHWs ($N=82$) from partner NGOs in Cape Town were recruited to receive training in task-shared mental health in a stepped wedge design. Only CHWs participating in the first cluster of this larger stepped wedge study (an estimated $n=30$) were enrolled in the current study, both to ensure feasibility of data collection and because of the estimated sample size needed for planned analyses. Based on the effect size seen in the preliminary study, power analyses conducted in G*Power 3 estimated 92% power at the 0.05 significance level with $n=30$ CHWs. No honorarium was provided, as attending trainings is a standard component of CHW roles, but refreshments were provided on training days.

Pre-training measures were collected by trained staff no more than one week prior to the beginning of training. Post-training measures were collected on the last afternoon of training. Any written measures were collected on paper in isiXhosa or

English, securely stored and then entered in English to a secure REDCap database (Harris et al., 2009). Though prior research in South Africa using similar methods was conducted in English (Spedding et al., 2022), role plays were conducted in isiXhosa to allow CHWs, who typically speak isiXhosa more fluently than English and speak isiXhosa with patients, to best demonstrate their skills. This decision was initially made after piloting data collection and training procedures in English with $n=17$ participants for the larger stepped-wedge study and was affirmed by Aim 1 findings, in which participants spoke about the importance of language in Cape Town. Role plays were video recorded, as is routine for clinical trainees (Lloyd et al., 2017), using a Samsung study tablet and stored on a secure University of Maryland server. No data collected from CHWs was shared with NGO staff and no data was collected from any non-CHW NGO staff who may have attended the training. Ethics approval was obtained from the South African Medical Research Council Human Research Ethics Committee.

Measures

ENhancing Assessment of Common Therapeutic factors (ENACT) rating scale. The ENACT is a behavioral coding rating tool for assessing LHW competence in task-shared mental health care, which was developed in Nepal as part of research to develop competencies for task-shared mental health care (Kohrt, Jordans, et al., 2015; Kohrt, Ramaiya, et al., 2015). It was used to extract predictor and outcome variables for the current study (see below). Since its development in Nepal, the ENACT has been adapted across settings for diverse types of task-sharing mental health programs, including in South Africa, and is a widely researched measure for

LHW assessment in task-shared mental health (Asher et al., 2021; Pedersen et al., 2021; Spedding et al., 2022). It can be used with a range of LHWs, from primary care providers to CHWs. It has strong inter-rater reliability in prior research and is now being disseminated by the WHO; it is intended that, as we did in Aim 1, implementers adapt it to their settings, both in terms of cultural context, clinical setting, and project focus (Kohrt et al., 2020; Kohrt, Jordans, et al., 2015). It is also currently one of the only measures for LHW assessment in task-shared mental health care. The original version included 18 items, four of which evaluated interpersonal skills (non-verbal communication skills, verbal communication skills, rapport building, and empathy/warmth). The other 14 items on the original ENACT assessed skill in the basic competencies of mental health care that are taught in a task-shared mental health training (e.g., assessment of suicidality, exploration of prior coping, explanation of confidentiality). The original ENACT was rated out of 3, with 1 indicating *needs improvement*, 2 indicating *done partially*, and 3 indicating *done well*; brief examples were provided of what each score meant for each item. This was the version used in the preliminary study analyses (Rose et al., 2023) and that has been used to date in South Africa (Spedding et al., 2022). More recently, the ENACT has been consolidated and refined to 15 items (four items on interpersonal skills and 11 items on basic competencies of mental health care) by the original research team, which is the version used in Aim 2 of the current study (Kohrt et al., 2020). In the newer 15-item version of the ENACT, each item is scored out of 4, with 1 indicating *harmful behaviors*, 2 indicating *some basic skills*, 3 indicating *all basic skills*, and 4 indicating *advanced skills*. Further, each item now has detailed operationalization for

each score level (e.g., for item 9, “exploring client’s explanation of problem,” a 1 (*harmful behaviors*) is operationalized as criticizing the client’s view of the problem as ignorant, etc... or endorsing harmful beliefs about the cause of the problem held by the client or their social network). Total possible score ranges from 15 to 60. Though both the predictor and outcome in the current study were extracted from only certain items at different timepoints, all 15 items were collected at both pre-training and post-training to facilitate assessment of reliability and pre-post changes.

The ENACT is collected by rating a standardized role play in which a LHW “meets” with a trained staff member portraying a patient with mental health concerns for approximately ten minutes. The trained staff member in the current study had experience delivering task-shared interventions, was from the local area, and was minimally involved in delivering the training. A different, yet similar, locally contextualized background story for the “patient” was used at pre- and post-training data collection to avoid participants recalling the patient’s background and primary concerns from the pre-training role play at the post-training timepoint. Because the larger studies focus on mental health and substance use stigma reduction, the role play “patients” experienced depression and alcohol use problems. The lead graduate student received training in conducting these role plays from the original research team and trained the staff member to conduct role plays. Please see supplemental materials for instructions given to CHWs before role plays and vignettes and guidelines used by trained staff members during role plays.

Using the video recording of each completed role play, trained staff members with experience delivering or supervising task-shared interventions and who were

from the local area rated each participant using the adapted ENACT. Because role plays had been conducted in isiXhosa, the rating was also conducted in isiXhosa by bilingual research assistants supervised by the lead graduate student. As described under Aim 1 “Implications for Aim 2,” rating guidelines were adapted by the current research team based on Aim 1 qualitative findings before translation, backtranslation, and rating. Two raters were minimally involved in providing the training itself and one rater was not involved in the training at all. We intended to relabel videos such that raters did not know the timepoint (pre- or post-training) of the video they were rating, but this was not possible as all CHWs wore uniforms to pre-training assessments, which were conducted prior to the training day while CHWs were working, but not to post-training assessments, which were conducted during the last day of the training. The lead graduate student also received training from the original research team in conducting ratings and trained the raters to conduct rating. Prior to conducting ratings, raters used practice videos from the setting to learn how to rate videos and discussed extensively with the lead graduate student. All videos were then rated by two raters and discussed to consensus; therefore intra-class correlation was 1.0. All raters were bilingual in isiXhosa and English, which facilitated rating in isiXhosa and consultation with English-speaking team members as needed. In the case that the trained staff member portraying the “patient” had forgotten to include a standardized prompt in a role play, the corresponding skill was initially coded as “missing” but then recoded to “some basic skills” before analysis to avoid penalizing the participant on that skill. Please see supplemental materials for the final English

version of the ENACT used for rating in this study. Please see Tables 1 and 2 for pre- and post-training correlations between individual ENACT items.

Pre-training interpersonal skills (predictor). Pre-training interpersonal skills were operationalized as total score on the four ENACT interpersonal skills items at the pre-training timepoint, extracted from the pre-training ENACT. The possible range was 4 to 16.

Post-training competence (outcome). Post-training competence were operationalized as total score on the 11 ENACT competencies of mental health care items at the post-training timepoint, extracted from the post-training ENACT. The possible range was 11 to 44.

A priori covariates. Prior mental health training, attendance at training, interest in mental health training, and current exposure to patients with mental health concerns were each identified a priori as potential covariates, based on experience from the preliminary study and from the broader training literature.

Prior mental health training. Before the beginning of training, participants completed a basic demographic questionnaire that included a question about any prior mental health training. This was included in analyses as a potential covariate, because prior mental health training experience, which may have influenced pre- and post-training data for the current training, is unevenly available throughout Cape Town, like other LMIC settings (Rathod et al., 2017). We also documented which organization each participant came from to explore potential differences between groups before analysis.

Attendance. Training attendance at each day of training was collected, to be included in analyses as a potential covariate, because there have been shown to be dose response relationships between attendance and training outcomes within task-shared mental health training (Kokole et al., 2022).

Interest in mental health training. Because interest in receiving mental health training has been demonstrated to affect training engagement and outcomes among non-specialists (Scantlebury et al., 2018), interest in receiving training in mental health care was extracted from items collected alongside the Social Distance Scale (SDS) and was included as a potential covariate. The SDS is a measure of stigmatizing attitudes that has been adapted for many stigmatized identities and contexts (Bogardus, 1925; Tsai et al., 2020). The version used in this study presented participants with two vignettes depicting individuals experiencing behavioral health difficulties; one vignette depicted an individual struggling with depression, and one depicted an individual struggling with substance use. Following collection of items on the SDS itself, the question “On a scale of 1 to 10, with 1 not being at all interested and 10 being very interested, how interested are you in getting training to learn how to help/assist someone like [name]” was also included. Responses across the two vignettes were averaged for each participant to obtain an average interest in mental health training score.

Current exposure to patients with mental health concerns. Again, using questions collected alongside the SDS, we extracted measures of how often CHWs reported working with patients experiencing behavioral health problems as potential covariates. The training may have felt more applicable to existing practice to some

CHWs than others and perceived usability of trainings is known to be associated with training engagement and outcomes (Lyon & Koerner, 2016). After completing the SDS, CHWs reported whether they had many, a few, one, or no patients with depression and, separately, with substance use.

Data analysis plan

Characteristics of participants. Descriptive statistics (means and standard deviations or frequencies and proportions) were calculated for: baseline demographics; potential covariates, including both those identified a priori (prior mental health training, attendance, interest in mental health training, and current exposure to patients with mental health concerns) and any that were identified by participants as part of Aim 1 qualitative analyses (please see Aim 1 results); total ENACT scores; total and individual interpersonal skills scores; and total and individual competence scores. Correlations between a priori covariates and potential covariates added based on Aim 1 results were also examined to ensure there were no concerns about collinearity between potential covariates before proceeding to further analytic stages. Additionally, any variables with insufficient variability (e.g., all, or almost all participants reported the same response) were excluded as potential covariates past the descriptive stage.

Change in ENACT scores from pre- to post-training. Change in total ENACT scores, total and individual interpersonal skills, and total and individual competencies were examined with paired t-tests and Wilcoxon signed rank tests. A Holm-Bonferroni correction (original p-value of 0.20) was used when examining pre-post change in individual skills due to the number of tests run.

Linear regression models examining the relationship between pre-training interpersonal skills and post-training competence. Using Kruskal-Wallis and Pearson correlation tests, bivariate associations between potential covariates, both those identified a priori and by Aim 1 participants, and the predictor and outcome were examined. These analyses were used to narrow down the pool of potential covariates, meaning that variables with non-significant associations with both the predictor and outcome in this sample were excluded as potential covariates past the bivariate stage. However, sensitivity analyses of final models were run with such covariates included and results were compared before finalizing results. Based on findings from the preliminary study (Rose et al., 2023), the association between change in interpersonal skills from pre- to post-training and the outcome (post-training competence) was also examined.

For the primary hypothesis examining the relationship between pre-training interpersonal skills and post-training competence, a linear regression model evaluated the relationship between pre-training interpersonal skills (predictor) and post-training competence (outcome), controlling for covariates. For the exploratory hypothesis examining the relationship between each individual pre-training interpersonal skill and post-training competence, the four interpersonal skills were included individually (i.e., non-verbal communication, verbal communication, rapport building, empathy/warmth) as predictors of total post-training competence, controlling for covariates. rStudio version 2022.7.2 (Build 576) was used for all analyses.

Chapter 3: Results

Aim 1

Characteristics of participants.

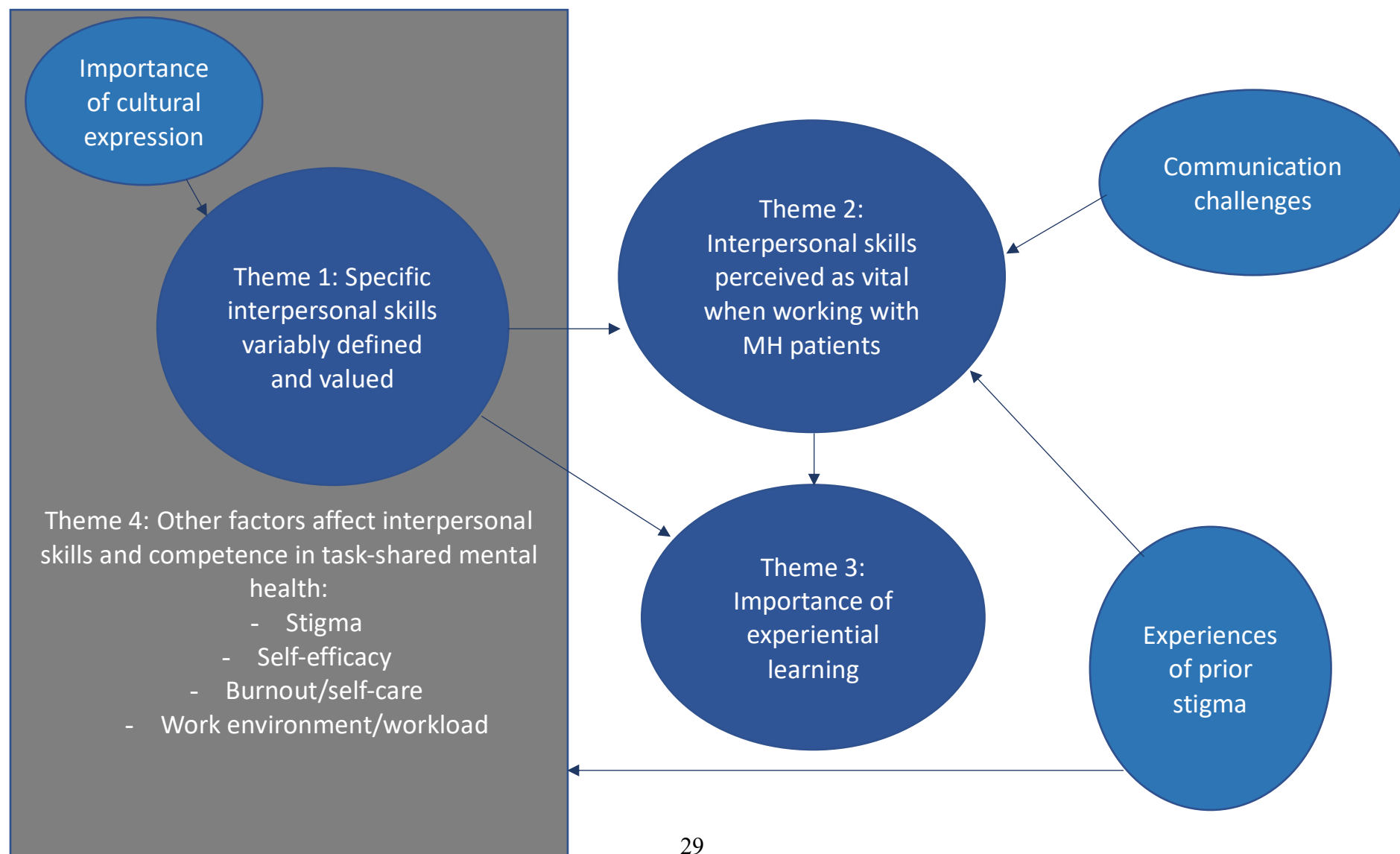
See Table 3 for sample characteristics. 85% of participants ($n=17$) were female and 80% ($n=16$) of participants were Black African. 25% ($n=5$) were CHWs and 75% ($n=15$) were stakeholders working with CHWs. Over half had been in their role for one to five years and were between the ages of 30 and 49. Twelve (60%) interviews were conducted primarily or entirely in isiXhosa and eight (40%) were conducted primarily or entirely in English; some participants used both languages.

Key themes.

Broadly, Aim 1 aimed to gather and explore stakeholder feedback on the role of interpersonal skills among LHWs in South Africa in delivering task-shared mental health care, with the goal of generating information on a key implementation topic previously little studied in South Africa. In Figure 3, we propose a conceptual map of how key themes relate to one another. Key themes identified were: 1) definitions and value attributed to specific interpersonal skills varied; 2) despite variation, interpersonal skills were perceived as critical for work with patients with mental health problems; 3) interpersonal skills and competencies in mental health are best improved through experiential learning, though time for this can be limited; and 4) other factors (e.g., stigma, workload) may affect interpersonal skills and broader competence among CHWs. Perspectives shared by stakeholders and CHWs themselves were consistent. Inter-rater reliability between coders was strong, with a kappa of 0.82.

Figure 3

Proposed conceptual map of themes and their hypothesized relationships



Theme 1: Definitions and value attributed to specific interpersonal skills

varied. When asked to describe strong interpersonal skills, participants varied in their descriptions and which skills they valued most. At least some participants reported that each of the four interpersonal skills specifically discussed in interview guides were most important. No participants described using formal, replicable methods for assessing CHW interpersonal skills.

Some participants defined interpersonal skills as related to good information gathering and to developing an accurate understanding of what patients are sharing, including an understanding of the patient's emotional state through what the patient may *not* be saying. One stakeholder said:

“To have verbal communication skill is alright but a person must also be very observant in order to be able to pick up those non-verbal cues.”

– Female, nurse coordinator, late 50's, isiXhosa

Other participants described an assessment-focused view of interpersonal skills as particularly helpful for drawing inferences about patients who are struggling to explain themselves in words. Interpersonal skills were also conceptualized as critical for validating patients in emotional distress. A CHW shared:

“The person will be biting their fingernails and what they are saying does not even make sense so while you are listening to the person speak nodding and showing that you are interested in what they are saying it helps to also pick up such things [e.g. nail-biting] from the patient.”

– Female, CHW, late 30's, isiXhosa

Other participants described strong interpersonal skills as related to how one approaches patients and paces interactions. One stakeholder shared:

“When you're building a rapport you don't just jump start and say, ‘No, we want you to start your medication’ Build a rapport ... even if it can take you maybe just two or three days just getting to know client and say to them, ‘Okay, I see today that you're not feeling well or you don't wanna talk. Here is my number, you can call me, or you can come at the facility. My name is so and so, I'm coming from this. And I'm going to come back again or I'm gonna give you a call’ and then you give them a call.”

– Female, senior therapist, late 30's, English

Poor interpersonal skills were described in similar ways across participants. Key signs of poor interpersonal skills included showing signs of irritation with patients, moving too quickly through a clinical interaction, being too blunt or direct in addressing patients, and seeming nervous with patients.

Importantly, there are cross-cultural differences in how interpersonal skills are expressed. Where trainees and managers are from different ethnic and cultural backgrounds, this can lead to differences of opinion in how to engage interpersonally with patients. Several NGO stakeholder participants shared examples where they had wanted to give feedback to CHWs so that they could improve their verbal communication but reconsidered after learning more about how the patient reacted to the CHW. A stakeholder noted:

“You know, it's not how I would speak to the patient. But then in a few times I wanted to address this with this with one or two CHWs. And then I observed

the patient was enjoying the banter... But, you know, when you work in these communities, you need to understand the cultures also. So, that's acceptable for the client. So as long as the client is not upset or feels disrespected, then I'm okay with it, you know?"

- Female, project manager, early 60's, English

Theme 2: Interpersonal skills as foundational for work with patients with mental health problems. Despite observed variability in how skills were operationalized, all participants valued strong interpersonal skills among CHWs with regards to task-shared mental health care. Moreover, most participants stated that interpersonal skills, however they were defined, were more important for working with patients with mental health concerns than patients with other health concerns. A key reason participants cited was enacted stigma towards mental health conditions that patients may have previously experienced. For example:

"And I think they they need to have ... basic understanding of the mental health issues so that [the approach] they use with the patient is not a judgmental one. It is not the one that will make these people feel like less of human beings because we've seen a lot of stigma attached to the people that use substances and the people that have got mental health. So just this basic humanity in you, as a CHW that deals with these patients can go a long way, in life."

- Female, manager, mid-40's, English

Some participants also viewed interpersonal skills as particularly important when working with patients with mental health problems for alternative reasons. These

participants reported that some interpersonal skills, such as non-verbal communication, helped them compensate for communication limitations they perceived were more common among patients with mental health problems than among other patients. As a result of such perceived limitations, they reported that other interpersonal skills, such as verbal communication, were actually less important with these patients. A stakeholder said:

“Because a person might not hear you right? But can see you right... or even if they understand the words, they're not like, interested in what you are saying, but they are looking at you and they can see what you are doing ... the nonverbal is more critical and it needs to be like practiced within mental health care because of like what we have said, because they look and they see more than they listen to you.”

– Female, community liaison officer, late-40's, English

Theme 3: Interpersonal skills and broader competence in task-shared mental health improved most effectively through experiential learning. In addition to viewing CHW interpersonal skills as important, all participants reported believing that these skills could be improved. When asked if a CHW did not have strong interpersonal skills, what they would suggest to help the CHW improve, many participants suggested that experiential learning (e.g., shadowing, role plays) would be the best way to help a CHW improve their interpersonal skills.

“To help with the training a person [CHW] can be paired with a skilled CHW where she can observe and shadow and learn from the skilled one. I think that

could be a quick way for a trainee to easily understand and adopt the skill and be able to apply it.”

– Female, nurse coordinator, late-50’s, isiXhosa

However, several participants noted that experiential learning of interpersonal skills can be time-consuming and that often intervention-focused trainings do not include enough time for more foundational relational skills. One stakeholder said:

“When you when you go to these trainings for the CHWs you'll find that the main focus will be about the project. Yes, they will be training about MI - motivational interviewing, ... if the training is two weeks, then they say the MI will be half of a day and forgetting that, in order for this person to perform their job [in the intervention], they need the [MI] skills. And then most of the days what will be done, it's the project, or what the project is about you see. So the training for these skills, it's just one day and there is no way that a person can able to practice what has been taught in one day.”

– Female, mid-30’s, CHW coordinator, English and isiXhosa

Theme 4: Other factors affect CHW interpersonal skills and broader competence in task-shared mental health services. Several other skills and external supports emerged as important for task-shared mental health work. The first of these was level of stigma towards mental health conditions. Participants suggested that stigmatizing beliefs held by CHWs would influence interpersonal skills, for example when they were unable to empathize with a patient using drugs. Discussions of stigma most often arose when participants were explaining why they felt that interpersonal

skills were more important for work with patients with mental health concerns compared to patients without mental health concerns. One participant said:

“Some beliefs are that they have been bewitched or they were troublesome in their neighborhood or they take drugs. So your own beliefs could make you become judgmental towards that person.”

– Female, case work supervisor, early-50’s, isiXhosa

Sufficient confidence and training were also cited as important and, in some cases, participants related lack of training in mental health to greater stigma towards mental health conditions, which in turn could affect how CHWs treated patients. Others felt that lack of training on mental health could lead a CHW to appear nervous or unsure when interacting with patients, which would harm rapport. A stakeholder said:

“So I think, for for for me, you know, self confidence. And for we need to empower our, our, our staff on that. Because, like I say, you cannot sell to people something that you look like yourself you're uncomfortable speaking about.”

– Female, manager, mid-40’s, English

Some participants also raised the need for self-care and wellness among CHWs. Participants suggested CHW burnout and personal mental health burden could negatively affect CHW interpersonal skills, reduce the quality of task-shared mental health counselling provided by CHWs and limit the degree to which CHWs are willing to take on mental health at all. A stakeholder said:

“They're also overburdened with their own issues. So they don't have capacity to take on another person's problems... they can't extend assistance to

someone else, because in that moment, they then wear that person's shoes, which triggers them, which makes them now non-functional at work, etc, etc. So that's what I've experienced with CHWs who don't want to [work in mental health].”

– Female, CHW coordinator, late 20’s, English and isiXhosa

Many participants related the work environments and job roles of CHWs to discussions of self-care, CHW wellness, and the ways in which burnout affects CHW engagement and performance. Unlike other factors, views of the difficulty of CHW roles and work environments was broader than the topic of task-shared mental health care integration and related to the expanding scope of CHW roles in general. One participant stated:

“The job description is expanding and expanding, you know, since we've had COVID. And every, all the articles I read, it's always the CHWs, they're the foot soldiers of whatever is happening... the work scope is is expanding, but not the salary, you know.... their role is becoming, it's much wider than it was initially.”

– Female, project manager, early 60’s, English

Implications for Aim 2

The second goal of Aim 1 data collection and analyses was to facilitate adaptations to and refinement of planned Aim 2 data collection and analyses. This included identification of any additional items that should be added to the ENACT, adjustments to the operationalization of ENACT items themselves, and the

identification of any potential additional covariates for Aim 2 analyses. Specific adaptations are described below and linked to the key themes described in Figure 3.

Additional items. Within qualitative interviews, participants did not suggest any additional interpersonal skills to add to the ENACT for Aim 2.

Operationalization of items. Within qualitative interviews (Theme 3), participants shared perspectives that task-shared mental health trainings often do not allow sufficient time for skill development, due to the need to focus on study operations or organizational objectives. While practicing ENACT rating, raters simultaneously identified that participants would sometimes not display a “harmful” level of a behavior but also not display “some basic skills.” In response to both inputs, we decided to add “missing” as a level to the rating form for all items², except for assessing suicidality and confidentiality. For these items, “no response” had already been defined as harmful.

It also became evident through both the qualitative interviews that patients with mental health problems were perceived as higher risk and more vulnerable than patients without mental health problems (Theme 2). Related to this, it became clear that the rating for the suicidality item needed to be adapted in this context. It was generally not perceived as appropriate that CHWs, who have relatively little intervention experience in general compared to other providers, respond to suicidality, so training content focused on when and how to refer to a supervisor. Therefore, the suicidality item rating was adapted to focus not on the CHW

² These scores were recoded as “some basic skills” beyond descriptive statistics to facilitate analysis.

themselves assessing or intervening on risk but instead on appropriate referral to a supervisor.

For non-verbal communication, based on participant perspectives on culturally appropriate interpersonal interactions with older people, we adjusted “appropriate eye contact” to include not making direct eye contact with older patients (Theme 1). For verbal communication, based on participant perspectives on the importance of language as part of cultural expression, we added “intentionally or repeatedly not speaking in the language the patient is using” to the operationalization of harmful behaviors (Theme 1).

Experience-driven additional covariates (Theme 4). Within qualitative interviews, participants described several constructs, both internal and external, they perceived as related to CHW interpersonal skills and broader competence – stigma, self-efficacy, burnout/self-care, and work environment/workload - and these in turn were considered as potential covariates for Aim 2, alongside covariates that had been identified a priori (prior mental health training, attendance, interest in mental health training, and current exposure to patients with mental health concerns).

Stigma. Participants identified stigma as a key factor influencing CHW interpersonal skills and broader competence in task-shared mental health. Within baseline measures for the larger studies, we had a measure available assessing stigma, the vignette-based Social Distance Scale. Items on the SDS include “Would you have a conversation with [name]” and “Would you make friends with [name].” SDS stigma scores range from 6 to 24, with higher scores indicating a desire for greater social distance from the person depicted in the vignette, and therefore, greater

stigma. Therefore, stigma towards depression (SDS – Depression) and stigma towards substance use (SDS – Substance Use) were each added as potential covariates, though it has been noted in prior work that associations between ENACT items and SDS items are mixed (Kohrt et al., 2019).

Self-efficacy and burnout/self-care. While participants also discussed the importance of self-efficacy as an individual-level factor influencing CHW interpersonal skills, there had been no measure of self-efficacy included in the baseline measures of the larger studies and it was not possible to add this as a potential covariate. The same was true for burnout/self-care.

Work environment/workload. Lastly, participants discussed work environment and expected workload as an external factor that would influence CHW interpersonal skills and competence in task-shared mental health work. We had weekly caseload size available as a measure of workload, and this was added as a potential covariate.

Aim 2

Broadly, Aim 2 aimed to evaluate the preliminary effectiveness of overall pre-training interpersonal skills in predicting post-training competence in task-shared mental health within the context of a LHW task-shared mental health training in South Africa. The primary hypothesis was that total pre-training interpersonal skills score would predict the total post-training competence score in this sample. Exploratory hypotheses were that each individual pre-training interpersonal skill would predict the total post-training competence score in this sample.

Characteristics of participants

See Table 4 for demographic information and sample characteristics. Twenty-seven individuals participated in the training. The role play recording was corrupted for one participant, and the analytic sample was therefore $n=26$. Participants came from two different NGOs (13 from each) and there were no notable differences between groups on interpersonal skills or competence. 100% of participants ($n=26$) were female, 100% ($n=26$) of participants were Black African, and 100% ($n=26$) reported that isiXhosa was their primary language. 23.1% ($n=6$) of participants were 30-39, 10 (38.5%) were 40-49 and 10 (38.5%) were 50 or older. 96.2% ($n=25$) had been a CHW for more than 5 years. The average reported weekly caseload was 48.2 ($SD=15.7$), with only $n=3$ participants reporting a caseload under 45 and one reporting a caseload of 100. Three (11.5%) participants reported any prior mental health training. Twenty-five (96.2%) participants attended the entire training, with one participant missing one day. Before training, average reported interest in receiving mental health training (on a scale of 1 to 10 with 10 being highest) was 9.9 ($SD=0.7$). With regards to experience working with patients with mental health problems, 46.2% ($n=12$) of participants reported having a few or many patients with depression and 26.9% ($n=7$) of participants reported having a few or many patients with substance use concerns. Three participants (11.5%) reported having no patients with depression and 42.3% ($n=11$) reported having no patients with substance use concerns. Pre-training stigma towards depression and substance use were both low; on the SDS, ranging from 6 to 24, with higher numbers indicating more stigma, average depression stigma score was 7.9 ($SD=2.1$) and average substance use stigma

score was 9.7 ($SD = 2.7$). Due to lack of variability observed at the descriptive stage, it was not possible to include several potential covariates in later analyses (prior mental health training, attendance, interest in training, and workload).

Pre-training clinical skills as measured by the ENACT were low overall. The mean total pre-training ENACT score was 30.8 ($SD=4.0$; scores range from 15 to 60 with higher numbers indicating greater skill). Within the ENACT, the mean pre-training interpersonal skills score (predictor for primary hypothesis) was 8.8 ($SD=1.4$, scores range from 4 to 16, with higher numbers indicating greater skill).

Change in ENACT scores (total, interpersonal, and other competencies) from pre- to post-training

At post-training, the mean total ENACT score was 33.0 ($SD=3.5$, scores range from 15 to 60, with higher numbers indicating greater skill). There was a significant increase in overall clinical skill as measured by total ENACT scores from pre- to post-training ($t(25)=2.54$, $p=0.02$). Within the ENACT, there was also a significant increase in interpersonal item scores from pre to post-training ($t(25)=3.29$, $p=0.003$). Post-training competence in the tasks of mental health was low (mean=23.0, $SD=2.5$, scores range from 11 to 44, outcome for primary hypothesis). There was not a significant increase in scores from pre- to post-training when examining only those competence items ($t(25)=1.65$, $p=0.11$).

When examining change in individual items using Wilcoxon signed rank tests (with a correction for multiple comparisons), the following ENACT skills showed significant improvement from pre- to post-training: verbal communication ($z = -3.01$, $p=0.003$) and explaining and promoting confidentiality ($z=-2.72$, $p=0.007$). While not

significant, more participants were rated as a 1 (harmful) at the post-training timepoint on the following skills: assessing risk/suicidality and promotion of realistic hope for change. At both the pre-training and post-training timepoints, a large proportion of participants were rated as missing several competence skills, meaning they did not demonstrate any “harmful” or any “helpful” behaviors in that domain. Please see Table 5 for item-level ENACT scores at both pre- and post-training and Table 6 for all pre-post comparisons.

Relationship between pre-training interpersonal skills and post-training competence (primary hypothesis)

Please see Table 7 for bivariate associations between potential covariates with sufficient variability for bivariate analyses, both those identified a priori and by Aim 1 participants, and predictor and outcome. No associations were significant. Neither was there a significant association between pre- to post-training change in interpersonal skills and post-training competence ($t(24)=1.06$, $p=0.30$).

When examining the primary hypothesis, pre-training interpersonal skills score did not significantly predict post-training competence score ($\beta= 0.53$, $p=0.14$). Please see Table 8. Model results remained not significant when including potential covariates during sensitivity analyses (existing work with patients - depression, existing work with patients – substance use, SDS – Depression, and SDS – Substance Use).

Relationship between individual pre-training interpersonal skills and post-training competence (exploratory hypotheses)

When examining the exploratory hypotheses, no individual pre-training interpersonal skills predicted total post-training competence score (non-verbal: $\beta=1.12, p=0.17$; verbal: $\beta=0.58, p=0.56$; rapport building: $\beta=1.09, p=0.32$; empathy/warmth: $\beta=0.63, p=0.46$). Please see Table 8. Model results remained not significant when including potential covariates during sensitivity analyses (existing work with patients - depression, existing work with patients – substance use, SDS – Depression, and SDS – Substance Use).

Chapter 4: Discussion

Findings add to the nascent but much needed literature on predictors of competence in task-shared mental health care among LHWs. Our first aim demonstrated qualitatively the importance of interpersonal skills to LHW task-shared mental health roles, which was consistent with findings from the preliminary study leading to this work (Rose et al., 2023). Quantitative findings from Aim 2 did not find a significant effect of interpersonal skills as a predictor of competence, which may reflect the small sample size and limited variability, including in the outcome, in the current sample. Current null findings indicate many future directions for further exploring predictors of competence in task-shared mental health care among LHWs. Further, although neither individual nor total interpersonal skills scores predicted post-training competence in this sample, findings do reveal improvement in interpersonal skills themselves during the course of the training. Specifically, the improvement in verbal communication from pre- to post-training were significant. This result echoes recent work that improvement in interpersonal skills preceded improvement in the other competencies of task-shared mental health among LHWs in Ethiopia (Asher et al., 2021). Interpersonal skills, and specifically one's ability to improve interpersonal skills, may still be useful to explore further.

The need for a greater common understanding of the core skills of task-shared mental health care

Overall, results point to the need for a clearer definition of foundational skills – both interpersonal and not - for LHWs in task-shared mental health and wider use of standardized measures when training LHWs in task-shared mental health care. A clearer common understanding of foundational skills among trainers and use of

evidence-based assessments within trainings could harmonize current practice and potentially improve training outcomes, even without the use of baseline predictors to tailor trainings. The WHO/United Nations Children's Fund (UNICEF) Foundational Helping Skills Trainers' Curriculum is intended to address some of these issues by enabling trainers and supervisors across the globe to integrate interpersonal skills and other common factors in a competency-based educational approach (Watts et al., 2021) and may represent a good platform for future studies.

Implications for training and training-focused research

In addition to reporting perceptions that interpersonal skills were core foundational skills for LHWs learning task-shared mental health work, participants reported beliefs that interpersonal skills could be improved through training interventions if they were not already strong. This is born out in quantitative data both in Aim 2 of this study and in prior studies with non-specialists (Asher et al., 2021; Hill et al., 2020; Rose et al., 2023). Further, the fact that interpersonal skills are modifiable is important. Identification of both trainees who are strong interpersonally *and* those who can *improve interpersonal skills through training* may be a promising approach, because it would ultimately support more LHWs in attaining competence. Understanding how other constructs such as willingness to learn, flexibility, and openness to new experiences relate to the ability to modify interpersonal skills would also be important areas of future work, with theory possibly adapted from the broader social sciences (von Stumm, 2018). For example, screening for baseline flexibility or openness to new experiences via a self-report measure would allow for a more efficient and tailored use of training resources than role play based assessments of

interpersonal skills. Interpersonal skills are currently the most commonly referenced selection criterion for LHWs within task-shared mental health training (Michelson et al., 2020; Murray et al., 2014; Surjaningrum et al., 2018; Venturo-Conerly et al., 2022), but if, through further research, interpersonal skills cannot be proven to be meaningfully related to competence outcomes among LHWs then efforts should also be made towards de-implementation of their use for selection (Upvall & Bourgault, 2018). Lastly, continuing to identify and examine other potential predictors of competence in task-shared mental health care and developing and testing strategies with which to effectively tailor task-shared mental health training content and delivery to trainee needs remain critical.

With regards to training content and format, participants spoke of the importance of experiential learning for improvement in these skills, which is consistent with what is known on best practices for training in general within task-shared mental health care (Jacobs et al., 2021; Kemp, Petersen, et al., 2019; Kohrt et al., 2019). However, many participants shared that finding sufficient time for experiential learning within trainings was a challenge, as training on project or study-specific skills typically fill the majority of training agendas. Foundational clinical skills were not the focus in the CHW trainings that they had experienced, which speaks to the need for researchers and implementers to more carefully balance skill-focused content with study- or project-specific needs during training. While the training provided in the current study included a strong focus on foundational clinical skills and substantial time for role play-based practice, it is also possible that a three-day training was too brief for the baseline skill level of participants and the number of

new skills covered. However, three days was the maximum amount of time that NGOs were able to devote to mental health training at one time, highlighting a tension inherent to task-sharing, where mental health is being incorporated into roles and organizations already tasked with many other responsibilities. It is also notable that participants scored lower on some competencies (e.g., assessment of risk, promotion of realistic hope for change) at post-training. This suggests that attending to new skills may have initially reduced their ability to implement existing skills, as is well known to occur in complex trainings (Young et al., 2014). It is possible that a more modular training model, with training delivered gradually over a series of months (Irungu et al., 2022), may be an appropriate fit for both NGO needs and the varied learning demands being placed on LHWs within task-shared mental health trainings. Staggering training content could not only help maximize the benefit and reach of trainings but, through research on training outcomes, also clarify the optimal sequence and methods of introducing the specific skills of task-shared mental health.

The role of supervision

Some participants suggested that supervisors or more skilled LHWs could help LHWs attain competence through in-service shadowing and training following structured training. Since we did not have follow up time points available for the current sample, it is not possible to compare competence pre- and post-supervision in the current study, however it is possible that the relatively low post-training competence scores may have improved through supervision. The importance of supervision in task-shared mental health is well documented (Jacobs et al., 2021; Raviola et al., 2019). However, there may be the need to develop supervision models

further in some settings. For example, if supervisors define skills variably or in non-patient centered ways (e.g., patients with mental health problems struggle to understand providers so verbal communication is less important), their abilities to help LHWs develop these skills outside of a training will likely also vary. There are other important limitations of placing too much responsibility on supervision for achieving competence among LHWs. If LHWs only develop foundational clinical skills in supervision following the didactic training, during the training they may have missed important intervention- or project-specific learning that builds on these foundational skills. Lack of space in low-resource clinical settings and privacy in patient homes where job shadowing could take place also represent additional barriers to reliance on supervisors for LHW skill development (Abrahams et al., 2022). In future work, it is important to continue to design studies that can disentangle training effects from supervision effects so that the role of each in helping LHWs attain competence can be more fully understood. This approach will have important practical implications, for example in shaping supervision models for task-shared mental health care and on the timing of when LHW competence is assessed in task-shared training programs.

The importance of other factors to LHW performance

Participants also cited other factors, such as levels of stigma towards mental health conditions and broader challenges in the work environment, that affect LHW performance. These findings add important context to emerging research on the importance of individual variability within task-shared mental health care (Asher et al., 2021; Rose et al., 2023; Shahmalak et al., 2019) and help link this emerging

literature with the well-established literature on systems-level barriers and facilitators for task-sharing mental health care (Ballard & Montgomery, 2017; Caulfield et al., 2019; Kok, Dieleman, et al., 2015; Kok et al., 2017; Kok, Kane, et al., 2015; Magidson et al., 2019; Naimoli et al., 2014; Regenauer et al., 2020; Scott et al., 2018). Stigma was frequently raised by participants, both as a reason that CHWs needed to be more skilled interpersonally when working with patients with mental health concerns and as a factor that could undermine CHWs' abilities when interacting with patients with mental health concerns. Though there was no association between interpersonal skills and stigma scores in the Aim 2 sample, this may have been due to relatively low levels of stigma within this sample (respectively 7.9 and 9.7 out of 24 for depression stigma and substance use stigma). Importantly, one of the key reasons that some Aim 1 participants perceived that CHWs needed stronger interpersonal skills was a perception that patients with mental health concerns are less able to communicate with others. This suggested stigmatizing beliefs may have been held by some Aim 1 participants themselves, who were primarily managers. Stigmatizing beliefs about mental health conditions are driven by complex factors and exist at many levels (Stangl et al., 2019), which speaks to the need for further research on mental health stigma reduction interventions globally. In some cases stigma reduction interventions may be most appropriate as training interventions for providers (Kohrt et al., 2021; Magidson et al., 2022), whether LHWs, their supervisors, or more formalized health workers, and in others they may be more appropriate as individual or population-level interventions (Kemp, Jarrett, et al., 2019; Maulik et al., 2017). Continuing to explore how stigma, as it exists at

multiple levels, interacts with LHW interpersonal skills and competence in task-shared mental health care would be important in future work.

Many participants also raised systems barriers to CHW interpersonal skills, which speaks to the important relationship that structural level discrimination (lack of appropriate spaces, resources, and policies to support mental health) may have with poor communication between LHWs and patients (Gurung et al., 2022; Myers et al., 2019; Thornicroft et al., 2022). Notably, it was not actually possible to examine workload as a potential covariate in Aim 2 because caseloads were so universally high in this sample. Awareness of the need for improved compensation models and more defined roles for CHWs has increasingly been gaining traction within lower-resource health systems (Ballard et al., 2021). Likewise, particularly in light of the COVID-19 pandemic, self-care needs and workplace wellness initiatives for health care workers, including for CHWs, have become more central to conversations about health care delivery worldwide (Johnson et al., 2022; Narasimhan et al., 2022). However, there remains a substantial need for health systems strengthening interventions worldwide and for much greater financing for task-shared mental health in particular (Liese et al., 2019). Without such systems interventions and advocacy, the scalability of task-sharing mental health care to LHWs is greatly undermined.

Design considerations, limitations, and future directions

We carefully considered important analytic and methodological questions in designing this study. However, it is important to consider findings in light of limitations. Our use of an exploratory sequential mixed methods design to collect quantitative data informed by qualitative data collection allowed our Aim 2 data

collection to be culturally adapted to the setting and pragmatically informed (Fetters et al., 2013). In the future, mixed methods designs will continue to be important in the development of measures of competencies for task-shared mental health care. These types of designs can help ensure balance between attention to culture and to statistical and measurement considerations. Further, integrating this study within a larger parent study ensured the feasibility of data collection in an international community-based setting during a global pandemic; data collection for Aim 1 took place between September 2021 and March 2022, during the fourth wave of COVID-19 in South Africa, and data collection for Aim 2 took place in August 2022, soon after the conclusion of the fifth wave. Yet it also introduced several limitations to the study design. Participants in Aim 1 data collection, who were recruited from a parent study focused on mental health and substance use stigma reduction intervention, may not be fully representative of LHWs and stakeholders in Cape Town. The larger study also focuses specifically on CHWs, which while they are the most common type of LHW in Cape Town, may differ in important ways from other LHWs. It would be important in future research to include other types of LHWs. Based on the measures available within the Aim 2 parent study, we were also unable to control for several potential covariates in Aim 2 that were identified within Aim 1 interviews, including self-efficacy and burnout. Self-efficacy was highlighted as an important construct among LHWs taking on task-shared mental health care in the prior English-language work on the ENACT in South Africa (Spedding et al., 2022), suggesting the potential importance of this construct in particular.

Further, as recruitment for the current study happened as part of a larger training, there may have been external factors that limited enrollment (e.g., a participant missing training due to a scheduling conflict). However, based on the effect size seen in preliminary study analyses, we expected that we would have 80% power at the 0.05 significance level with only $n=22$ out of 30 planned CHW participants. With $n=26$ participants in our final sample, enrollment should not have undermined the ability to find significant predictors. However, variability within this sample may have been lower than in the preliminary study. Variability may have been further limited by the fact that trainees were selected from only two organizations, research staff accidentally left some standardized prompts out of role plays in a few instances, or by the quality of translation or rating. However, best practices for translation were followed and training on conducting and rating role plays was provided by the measure's original developer, with substantial practice and discussion completed with the lead graduate student throughout the process to support reliability. Additionally, raters discussed all ratings together and arrived at a consensus before ratings were finalized. Yet, the use of a consensus rating approach may have inflated the apparent reliability of the measure as seen in final reported scores. Further, the measure may have been insufficiently adapted to the needs of this sample. This study was led by an American graduate student and adapted a measure originally developed in Nepal by a team led by an American clinician and researcher to use in an isiXhosa-speaking community in South Africa. Despite qualitative interviews to guide adaptation, the constructs of interest may not have been accurately captured in this context. For example, no additional interpersonal skills were elicited in qualitative

interviews, which was unexpected. It is possible use of more open-ended questions about interpersonal skills before presenting existing interpersonal skills would have led to a different result and a more refined measure. Or it may have been appropriate to remove or further adapt some of the competence items; the English-language study on the original ENACT conducted in South Africa did remove certain competence items (Spedding et al., 2022).

A pilot sample size will also not allow for the use of more complex statistical methods, such as models including interactions and non-linear growth functions. These approaches are recommended in any future work with larger samples and could be pursued as a follow-up to the current study once data is available from the larger stepped wedge trial ($N=82$), which remains ongoing. With larger samples, it would also be possible to conduct factor analyses of the ENACT (Tavakol & Wetzel, 2020). It is possible that there are multiple competence factors within this measure, instead of just one. Examining only one outcome in this study may have therefore masked training outcomes within specific domains. In the longer term, use of within-subjects designs would also help clarify which training strategies most optimally support training outcomes (Kim, 2010). Further statistical analyses would be critical to the development of any reliable and valid tools for pre-training assessment of LHWs with the aim of making predictions about competence in task-shared mental health care and any interventions intended to help improve training outcomes. However, it also remains important to develop psychometrically sound methods that are effective at making predictions about smaller samples; the current study sample size is representative of many task-shared mental health training cohorts. Likewise, though it

can be challenging to develop brief measures of high psychometric quality (Kemper et al., 2019), it will be important that any future measures developed are brief.

Though the feasibility of pre-training screening of LHWs has yet to be explored with stakeholders, due to limited time and resources for task-shared mental health training, it is unlikely that lengthy measures will be feasible for implementers.

Additionally, though we have chosen to build this study around a role play based assessment of LHWs as role plays may serve as a proxy for actual practice, in the future it would be important to understand the relationship between LHW interpersonal skills and in-service competence as well as the relationship between LHW interpersonal skills and patient outcomes, collecting both LHW and patient data at a range of timepoints (e.g., post-training, post-supervision, one year later).

Collecting follow-up data on the last day of the training was also intended to support the feasibility of data collection but limited the time for skill development among trainees in this study. It would also be important to explore patient perspectives on LHW competence; the literature on competence from HICs has often found differences in patient ratings of providers and specialist ratings of providers (Norcross & Lambert, 2011). Use of the ENACT in its current version also requires a considerable investment of training. It would be important to test lay rater use of the measure, which may be more useful for implementers, to explore if these are as valid as ratings by trained raters (Rezeppa et al., 2021). Importantly, lay raters and patients may better represent the community and introduce new cultural considerations missed by trained rater research assistants, despite their shared cultural background.

As more LHW assessment measures are developed in LMIC settings, it would also be important to examine the relationship between interpersonal skills and competence using completely standalone measures of LHW interpersonal skills and competence, instead of with variable sets extracted from the ENACT, particularly because the internal consistency of the interpersonal skills and competence items examined as standalone measures was low. However, no such standalone measures were available at the time of this study. Instead, we used distinct item sets collected at distinct timepoints to construct our measures in this study and report internal consistency of these item sets for transparency. We chose this approach, instead of adapting a more comprehensive therapist assessment from HIC settings, because the ENACT was designed for LHWs in LMICs and its items were therefore likely more valid and its length likely more feasible for our context. The decision to conduct and rate role plays in isiXhosa also allowed us to better capture our planned constructs for this context, while producing a version of the ENACT in a primary Western Cape language it had not previously been available in and that could be validated in future research.

Lastly, exploring the implementation outcomes of using assessments to predict LHW competence in task-shared mental health care also represents an important area of future work. Even if a very strong predictor of LHW training outcomes is identified in future research, if researchers or implementers do not find this predictor or the methods used to assess it feasible (practical to deliver), acceptable (satisfactory in terms of content and complexity), or appropriate (useful to them), this predictor will be of very limited actual utility (Proctor et al., 2011).

Communicating to implementers that any pre-training assessments of LHWs are intended to support optimal training and tailor trainings to trainee needs and not necessarily to exclude individuals from training may be important for acceptability in particular.

Conclusions

Supporting more LHWs in attaining competence in task-shared mental health care is critical to carrying through on the promise that task-sharing offers for expanding access to psychological care globally. While interpersonal skills have long been known to be foundational among mental health specialists in high-income settings and are commonly referenced as criteria for selection of LHWs for task-shared mental health training in low- and middle-income settings, findings reveal that there is a need for a stronger common understanding of how to select and train LHWs for task-shared mental health roles. Within qualitative findings, participants varied in how they defined interpersonal skills and spoke to the challenges of skill development among LHWs. Within quantitative findings, no interpersonal skills predicted post-training competence. Yet, participants did improve on interpersonal skills during training, suggesting that interpersonal skills and improvement in interpersonal skills should potentially be further explored as predictors of competence in future studies with larger and more varied samples, possibly using data from the larger, ongoing trial in which the current study was embedded. Overall, further selection, training, and supervision-focused research that can inform training interventions to support more LHWs attain competence in task-shared mental health care is critically needed to help close the global mental health treatment gap.

Appendices

Table 1: Correlation between ENACT items at pre-training timepoint

	en_1	en_2	en_4	en_6	en_3	en_5	en_7	en_8	en_9	en_10	en_11	en_12	en_13	en_14	en_15
en_1	1.0														
en_2	0.261	1.0													
en_4	-0.032	0.090	1.0												
en_6	0.412*	0.410*	-0.011	1.0											
en_3	0.217	0.308	0.144	0.374	1.0										
en_5	0.160	0.458*	0.352	0.536*	0.380	1.0									
en_7	-0.034	0.445*	0.367	0.438*	0.151	0.369	1.0								
en_8	-0.224	0.553*	0.174	-0.014	0.392*	0.246	0.267	1.0							
en_9	0.092	-0.066	0.220	0.113	0.123	0.300	-0.102	-0.127	1.0						
en_10	0.135	0.249	0.424*	0.153	0.097	0.311	0.007	0.263	0.505*	1.0					
en_11	0.203	0.249	0.135	0.316	0.272	0.433*	0.326	0.100	0.415*	0.091	1.0				
en_12	0.247	0.591*	0.257	0.417*	0.144	0.515*	0.367	0.336	0.220	0.424*	0.135	1.0			
en_13	0.102	0.046	-0.372	0.429*	-0.085	0.372	0.071	-0.103	0.058	0.046	0.335	0.068	1.0		
en_14	0.361	0.104	-0.15	0.073	0.025	0.119	-0.021	0.144	-0.239	-0.014	0.269	0.110	0.320	1.0	
en_15	0.246	0.477*	0.039	0.629*	0.267	0.652*	0.303	0.159	0.461*	0.477*	0.427*	0.539*	0.570*	0.007	1.0

Table 2: Correlation between ENACT items at post-training timepoint

	en_1	en_2	en_4	en_6	en_3	en_5	en_7	en_8	en_9	en_10	en_11	en_12	en_13*	en_14	en_15
en_1	1.0														
en_2	0.221	1.0													
en_4	-0.035	0.184	1.0												
en_6	0.579*	0.316	0.166	1.0											
en_3	0.373	0.454*	0.022	0.533*	1.0										
en_5	-0.081	0.228	0.433*	0.306	-0.116	1.0									
en_7	-0.025	0.251	0.132	0.022	-0.035	0.305	1.0								
en_8	-0.126	-0.158	-0.300	0.112	0.080	0.058	0.247	1.0							
en_9	0.224	-0.055	-0.029	0.362	0.209	-0.175	0.046	0.121	1.0						
en_10	0.268	-0.320	-0.053	0.279	-0.171	-0.123	-0.160	0.085	0.703*	1.0					
en_11	0.126	0.428*	0.300	0.225	0.241	0.260	0.317	0.000	0.156	-0.192	1.0				
en_12	0.340	0.205	0.284	0.486*	0.347	0.047	0.293	-0.032	0.098	-0.156	0.292	1.0			
en_13*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0		
en_14	-0.062	0.205	0.490*	-0.040	-0.063	0.543*	0.435*	-0.224	0.015	-0.176	0.318	0.191	NA	1.0	
en_15	-0.056	0.364	0.300	0.212	0.094	0.318	0.440*	0.040	0.330	-0.085	0.361	0.454*	NA	0.376	1.0

*Item 13 had no variability across participants at the post-training timepoint (100% of participants scored a 2) and it is therefore not possible to calculate correlation with other items.

Table 3: Demographic characteristics of Aim 1 participants (n=20)

Characteristic	n (%)
Gender	
Female	17 (85%)
Male	3 (15%)
Age	
21-29 years	2 (10%)
30-39 years	4 (20%)
40-49 years	9 (45%)
50+ years	6 (30%)
Race	
Black African	16 (80%)
White	3 (15%)
More than one race	1 (5%)
Primary language of interview	
isiXhosa	12 (60)
English	8 (40)
Type of participant	
LHW	5 (25%)
Stakeholder working with LHWs	15 (75%)
Years in role	
< 1 year	3 (15%)
1-3 years	8 (40%)
3-5 years	4 (20%)
5+ years	5 (25%)

Table 4: Demographic characteristics of Aim 2 participants (n=26)

Characteristic of CHW	n (%) or average (SD)
Gender	
Female	26 (100)
Age	
21-29 years	0 (0)
30-39 years	6 (23.1)
40-49 years	10 (38.5)
50+ years	10 (38.5)
Race	
Black African	26 (100)
Primary language	
isiXhosa	26 (100)
Time in role	
More than 5 years	25 (96.2)
3 to 5 years	1 (3.9)
Weekly caseload*	48.2 (15.7)
Prior mental health training	
Yes	3 (11.5)
No	23 (88.5)**
Attendance at all days of training	
Yes	25 (96.2)
No	1 (3.9)***
Interest in mental health training, from 1 to 10	9.9 (0.7)
Existing work with patients - depression	
Many patients	2 (7.7)
A few patients	10 (38.5)
One patient	11 (42.3)
No patients	3 (11.5)
Existing work with patients— substance use	
Many patients	1 (3.8)
A few patients	6 (23.1)
One patient	8 (30.8)
No patients	11 (42.3)
SDS - Depression (range: 6 to 24)	7.9 (2.1)
SDS - Substance Use (range: 6 to 24)	9.7 (2.7)
Pre-training Total ENACT (range: 15 to 60)	30.8 (4.0)
Pre-training Interpersonal (range: 4 to 16)	8.8 (1.4)
Pre-training Competence (range: 11 to 44)	22.0 (2.9)
Post-training Total ENACT (range: 15 to 60)	33.0 (3.5)
Post-training Interpersonal (range: 4 to 16)	9.9 (1.4)
Post-training Competence (range: 11 to 44)	23.0 (2.5)

* n=22 reported caseload of between 45 and 60, with n=19 reporting caseload of 50

**Prior exposure was 3, 4, and 10 years prior

*** One participant attended 2 of 3 days

Table 5: Item-level ENACT scores of Aim 2 participants (n=26) at pre- and post-training

ENACT Item	Pre-training								Post-training							
	1	%	2 (0)	%	3	%	4	%	1	%	2 (0)	%	3	%	4	%
<i>Interpersonal</i>																
en_1: Nonverbal communication	2	7.69	14 (0)	53.85	10	38.46	0	0.00	1	3.85	7 (0)	26.92	18	69.23	0	0.00
en_2: Verbal communication	2	7.69	19 (0)	73.08	5	19.23	0	0.00	0	0.00	10 (0)	38.46	16	61.54	0	0.00
en_4: Rapport building	1	3.85	20 (0)	76.92	5	19.23	0	0.00	0	0.00	18 (2)	69.23	8	30.77	0	0.00
en_6: Empathy/warmth	2	7.69	15 (2)	57.69	9	34.62	0	0.00	2	7.69	13 (1)	50.00	11	42.31	0	0.00
<i>Competence in Mental Health Care</i>																
en_3: Explain and promote confidentiality*	4	15.38	22 (1)	84.62	0	0.00	0	0.00	1	3.85	19 (3)	73.08	5	19.23	1	3.85
en_5: Normalization of feelings	4	15.38	19 (10)	73.08	3	11.54	0	0.00	0	0.00	24 (10)	92.31	2	7.69	0	0.00
en_7: Assessment of harm and developing response plan**	7	26.92	4 (4)	15.38	15	57.69	-	-	9	34.62	6 (6)	23.08	11	42.31	-	-
en_8: Connect to social functioning and impact on life	8	30.77	17 (13)	65.38	1	3.85	0	0.00	1	3.85	25 (18)	96.15	0	0.00	0	0.00
en_9: Explore client's explanation for problem	0	0.00	24 (4)	92.31	2	7.69	0	0.00	0	0.00	19 (0)	73.08	7	26.92	0	0.00
en_10: Involvement of family and significant others	1	3.85	22 (15)	84.62	2	7.69	1	3.85	0	0.00	22 (13)	84.62	4	15.38	0	0.00
en_11: Collaborative goal setting	6	23.08	19 (3)	73.08	1	3.85	0	0.00	4	15.38	18 (3)	69.23	4	15.38	0	0.00
en_12: Promotes realistic hope for change	1	3.85	20 (1)	76.92	5	19.23	0	0.00	4	15.38	20 (1)	76.92	2	7.69	0	0.00
en_13: Incorporates coping mechanisms and prior solutions	1	3.85	25 (24)	96.15	0	0.00	0	0.00	0	0.00	26 (24)	100.0	0	0.00	0	0.00
en_14: Psychoeducation with local terminology	5	19.23	15 (3)	57.69	6	23.08	0	0.00	2	7.69	16 (6)	61.54	7	26.92	1	3.85
en_15: Eliciting feedback	2	7.69	23 (13)	88.46	1	3.85	0	0.00	1	3.85	22 (12)	84.62	3	11.54	0	0.00

* Confidentiality prompt was accidentally not included within vignette for 1 participant at pre-training and 3 participants at post-training, so these were coded as a missing (0) and then recoded as 2 for analysis.

** In adaptation, levels 2 (some basic skills) and 4 (advanced skills) were removed for item 7, however suicidality prompt was accidentally not included for 4 participants at pre-training and 6 participants at post-training, so these were coded as missing (0) and then recoded as 2 for analysis.

Table 6: Paired t-tests and Wilcoxon signed rank tests comparing pre- and post-training data (n=26)

Comparison	M	(SD)	t or z	df	p	d
<i>Total level comparisons (paired t-tests)</i>						
Pre-training ENACT	30.8	4.0	2.54	25	0.02	2.15
Post-training ENACT	33.0	3.5				
Pre-training interpersonal skills	8.8	1.4	3.29	25	0.003	1.08
Post-training interpersonal skills	9.9	1.4				
Pre-training competence	22	2.9	1.65	25	0.11	1.08
Post-training competence	23	2.5				
<i>Pre- to post-training item-level comparisons (Wilcoxon signed rank test)*</i>						
en_1: Nonverbal communication	-	-	-2.33	-	0.02	-
en_2: Verbal communication	-	-	-3.01	-	0.003	-
en_4: Rapport building	-	-	-1.26	-	0.21	-
en_6: Empathy/warmth	-	-	-0.39	-	0.70	-
en_3: Explain and promote confidentiality	-	-	-2.72	-	0.007	-
en_5: Normalization of feelings	-	-	- 0.85	-	0.40	-
en_7: Assessment of harm and developing response plan	-	-	1.23	-	0.22	-
en_8: Connect to social functioning and impact on life	-	-	-2.12	-	0.03	-
en_9: Explore client’s explanation for problem	-	-	-1.89	-	0.06	-
en_10: Involvement of family and significant others	-	-	- 0.75	-	0.46	-
en_11: Collaborative goal setting	-	-	-1.31	-	0.19	-
en_12: Promotes realistic hope for change	-	-	1.90	-	0.06	-
en_13: Incorporates coping mechanisms and prior solutions	-	-	-1.00	-	0.32	-
en_14: Psychoeducation with local terminology	-	-	-1.13	-	0.26	-
en_15: Eliciting feedback	-	-	-1.02	-	0.31	-

* Due to the number of comparisons, a Holm-Bonferroni correction (original alpha value of 0.20) was used for significance testing of change in individual items

Table 7: Bivariate associations between predictor and outcome variables and possible covariates and between pre-post change in predictor and the outcome

Variable*	Relationship with pre-training interpersonal skills (predictor)**				Relationship with post-training competence (outcome)**			
	H	t	df	p	H	t	df	p
Existing work with patients – depression [°]	5.73	-	6	0.45	5.07	-	9	0.83
Existing work with patients – substance use [°]	4.21	-	6	0.65	2.22	-	9	0.99
SDS – Depression $\boxtimes$	-	0.05	24	0.96	-	-0.89	24	0.38
SDS – Substance Use $\boxtimes$	-	0.93	24	0.36	-	-1.02	24	0.32
Pre-post improvement in interpersonal skills •	-	-	-	-	-	1.06	24	0.30

* Due to lack of observed variability, prior mental health training, attendance, interest in mental health training, and workload were not explored past descriptive stage

** Using Kruskal-Wallis or Pearson's correlation tests

[°] Identified a priori

$\boxtimes$ Identified by Aim 1 participants

• Not considered as potential covariate. Rather this association was explored based on findings from preliminary study.

Table 8: Linear regression models of the relationship between pre-training interpersonal skills and post-training competence (n=26)

Predictor	β	Std. error	F	df	p
<i>Total pre-training interpersonal skills (primary hypothesis)</i>					
Pre-training interpersonal skills	0.53	0.35	2.36	1, 24	0.14
<i>Individual pre-training interpersonal skills (exploratory hypotheses)</i>					
Pre-training nonverbal communication	1.12	0.79	2.01	1, 24	0.17
Pre-training verbal communication	0.58	0.98	0.36	1, 24	0.56
Pre-training rapport building	1.09	1.07	1.03	1, 24	0.32
Pre-training empathy/warmth	0.63	0.83	0.57	1, 24	0.46

Supplemental Materials

Note: This document is meant to be a guide for the facilitator to structure the interviews; however, the facilitator is encouraged to follow the participants responses and probe to gather as accurate a sense of their perspectives as possible. The primary topic areas will stay the same, but the specific questions we expect to change based on information shared during the respective interviews.

Aim 1: Examining Stakeholder Perspectives on Interpersonal Skills of CHWs Being Trained to Work with Patients with Depression and Substance Use – CHW Version (English Version)

Introduction: This interview will take approximately 45 minutes and at any time you need a break, please feel free to say so and I will stop. The reason for this interview today is for me to hear about your perspectives on what skills are important among community health workers/community care workers and for community health workers/community care workers who will be trained in mental health care. There are no right or wrong answers, I am very interested in hearing what you have to say. I will be tape-recording this session, but your name will not be on the tape, you will be given a number. Any time you want to stop the interview or have me turn off the tape, you can tell me and we will stop. After the session, the tape will be typed up into a transcript, and the original tape will be erased. If you happen to refer to a name during the session, the name will be disguised in the transcript. The only people who will see this transcript are involved in this project. What you share during this interview will in no way affect your job or work here. We would appreciate if you can be as honest as you can in your responses. You are the expert on the topics that we will be discussing. Do you have any questions before we start?

Interviewer to turn on recorder before beginning.

Demographics:

1. First, I would like to confirm the demographic information you have provided us previously. Please let me know if any of the following information has changed (*read out demographic information provided for parent study interview and ask for corrected information as needed*).

Understanding participant view of interpersonal skills:

2. How do you as a CHW build relationships and connect emotionally with patients?
 - a. What about patients with mental health problems?
3. How would you define people skills?
4. Some people define people skills as the skills that a person uses to communicate and interact with other people. What people skills do you think you as a CHW use when working with patients?

- a. What about patients with mental health problems?
- 5. Now I would like to describe a few people skills that an individual can have. The first one is non-verbal communication. This includes body language or gestures, making eye contact, and facial expressions.
 - a. How do you use your face and body to build connection with patients?
 - b. Do you do anything differently depending on who you are talking with? Does that differ based on gender or age of your patient?
- 6. Next is verbal communication. This is how someone says things to another person, like their tone of voice and how someone asks questions and speaks to someone.
 - a. How do you use your voice and what you say to build connection with patients?
 - b. Do you do anything differently depending on who you are talking with? Does that differ based on gender or age of your patient?
- 7. Rapport building is how someone builds a connection with someone else. This can include how you introduce yourself and or how you show someone you are interested in what they are saying.
 - a. How do you show to your patients that you are interested in them and what they are saying?
 - b. Do you do anything differently depending on who you are talking with? Does that differ based on gender or age of your patient?
- 8. Expressing empathy is when you show you understand someone else. For example, how you show someone that you understand and want to support them with their concerns and problems.
 - a. How do you show your patients and that can understand the concerns or problems they are dealing with?
 - b. Do you do anything differently depending on who you are talking with? Does that differ based on gender or age of your patient?
- 9. What other things you do to build relationships and connect with your patients?

Understanding participant ranking of interpersonal skills importance:

In General

- 10. Out of all the things you do to connect with patients, such as use non-verbal skills, verbal skills, building rapport and expressing empathy, which one is the most important in building connection with your patients?
 - a. What makes you say this one is the most important?
 - b. Is there one you think isn't as important in building a connection with patients?
 - c. What makes you say it's not as important?

Mental Health

11. Out of all the things you do to connect with patients, such as use non-verbal skills, verbal skills, building rapport and expressing empathy, is there one that you think is the most important in building connection with patients with mental health problems?
 - a. What makes you say this one is the most important?
 - b. *(If different than answer to question 10)* What makes this skill more important for working with mental health problems than for other patients you have?
 - c. Is there one you think isn't as important in building a connection with patients with mental health problems?
 - d. What makes you say it's not as important?

Additional Thoughts:

12. Are there any other things that support you in being a CHW when you work with patients with mental health problems? For example, knowing someone with a mental health problem, prior training, or having a supportive work environment?
 - a. Why is that important?
13. Do you have any other thoughts or comments about what we have talked about today?

Thank you for your help. These are all the questions I have for you today. You have provided us with a lot of useful information during this discussion. Thanks again for your time—we appreciate all of your help.

Note: This document is meant to be a guide for the facilitator to structure the interviews; however, the facilitator is encouraged to follow the participants responses and probe to gather as accurate a sense of their perspectives as possible. The primary topic areas will stay the same, but the specific questions we expect to change based on information shared during the respective interviews.

Aim 1: Examining Stakeholder Perspectives on Interpersonal Skills of CHWs Being Trained to Work with Patients with Depression and Substance Use – Supervisor Version (English Version)

Introduction: This interview will take approximately 45 minutes and at any time you need a break, please feel free to say so and I will stop. The reason for this interview today is for me to hear about your perspectives on what interpersonal skills are important among community health workers/community care workers and for community health workers/community care workers who will be trained in mental health care. There are no right or wrong answers, I am very interested in hearing what you have to say. I will be tape-recording this session, but your name will not be on the tape, you will be given a number. Any time you want to stop the interview or have me turn off the tape, you can tell me and we will stop. After the session, the tape will be typed up into a transcript, and the original tape will be erased. If you happen to refer to a name during the session, the name will be disguised in the transcript. The only people who will see this transcript are involved in this project. What you share during this interview will in no way affect your job or work here. We would appreciate if you can be as honest as you can in your responses. You are the expert on the topics that we will be discussing. Do you have any questions before we start?

Interviewer to turn on recorder before beginning.

Demographics:

1. First, I would like to confirm the demographic information you have provided us previously. Please let me know if any of the following information has changed (*read out demographic information provided for parent study interview and ask for corrected information as needed*).

Understanding participant view of CHW interpersonal skills:

2. How do you think CHWs build relationships and connect emotionally with patients?
Probe: Tell me an example of a time when you saw a CHW really connect with a patient. What was that person doing?
3. How would you define interpersonal or people skills?
4. Some people define interpersonal skills as the skills that a person uses to communicate and interact with other people. What interpersonal skills do you think are important for CHWs to use when working with patients?

- a. What about for CHWs working with patients with mental health problems?
5. Now I would like to describe a few interpersonal skills that an individual can have. The first one is non-verbal communication. This includes body language or gestures, making eye contact, and facial expressions.
 - a. What would it look like to you if someone was skilled in this area?
 - i. Probe: Tell me an example of a time when you saw a CHW have good non-verbal communication with a patient. What was that CHW doing?
 - b. ... was not skilled in this area?
 - c. Would that look the same based on who someone is interacting with? Or could that differ based on gender, age of who someone is talking to?
6. Next is verbal communication. This is how someone says things to another person, like their tone of voice and how someone asks questions and speaks to someone.
 - a. What would it look like to you if someone had strong verbal communication skills?
 - i. Probe: Tell me an example of a time when you saw a CHW have good verbal communication with a patient. What was that CHW doing?
 - b. ... poor verbal communication skills?
 - c. Would that look the same across all people? Or could that differ based on gender, age of who someone is talking to?
7. Rapport building is how someone builds a connection with someone else. This can include how you introduce yourself and or how you show someone you are interested in what they are saying (beginning of the interaction).
 - a. What would it look like to you if someone had strong rapport building skills?
 - i. Probe: Tell me an example of a time when you saw a CHW have good rapport building skills with a patient. What was that CHW doing?
 - b. ... poor rapport building skills?
 - c. Would that look the same across all people? Or could that differ based on gender, age of who someone is talking to?
8. Expressing empathy is when you show you understand someone else. For example, how you show someone that you understand and want to support them with their concerns and problems.
 - a. What would it look like to you if someone had strong skills at expressing empathy?

- i. Probe: Tell me an example of a time when you saw a CHW have good empathy expression skills with a patient. What was that CHW doing?
 - b. ... poor empathy expression skills?
 - c. Would that look the same across all people? Or could that differ based on gender, age of who someone is talking to?
- 9. Are there any other interpersonal skills you think are important for community health workers/community care workers to have?
 - a. Why is that skill important?
 - b. What would it look like if someone had strong (skill suggested in 9) skills?
 - i. Probe: Tell me an example of a time when you saw a CHW have good ____ skills with a patient. What was that CHW doing?
 - c. What would it look like if someone has medium (skill suggested in 9) skills?
 - d. What would it look like if someone had poor (skill suggested in 9) skills?
- 10. Repeat question 9 as needed until participant has no further suggestions.
- 11. If a CHW did not have good interpersonal skills, how do you think that could be improved?
 - Probe: Do you think interpersonal skills are trainable skills that CHWs can improve in?
 - Probe: Do you think it's necessary to recruit CHWs who have some level of interpersonal skills already? What level?

Understanding participant ranking of interpersonal skills importance:

In General

- 12. Out of all the things someone could do to connect with patients (*repeat* non-verbal skills, verbal skills, rapport building, and expressing empathy (and any participant added in question 9)), which skill do you think is most important for people working as community health workers/community care workers in South Africa?
 - a. What makes you say this one is the most important?
- 13. Which one of these do you think is the least important for people working as community health workers/community care workers in South Africa?
 - a. What makes you say this one is the least important?

Mental Health

- 14. If a community health worker/community care worker were to start working with people with mental health problems, is there one of these skills we have

talked about (nonverbal, verbal, rapport building, empathy, other) that you would think would be most important?

- a. What makes you say this one is the most important?
- b. *(If different than answer to question 12)* What makes this skill more important for mental health care than other types of community health worker/community care worker tasks?

15. If a community health worker/community care worker were to start working with people with mental health problems, is there one of these skills we have talked about that you would think was least important?

- a. What makes you say this one is the least important?
- b. *(If different than answer to question 13)*, what makes this skill less important for mental health care than other types of community health worker/community care worker tasks?

Focusing in on non-verbal communication:

We have done some data analysis of community health worker data that showed that strong non-verbal communication skills, such as good eye contact, welcoming facial expression, and body position, were more important than someone's verbal communication, rapport building, or empathy expression skills before training in mental health care.

16. What do you make of that finding?

17. If a CHW has observed poor non-verbal skills when working with a patient with mental health problems, do you think it might indicate anything about how they feel about working with patients with mental health problems?

Probe: What do you think it might indicate?

Probe: do you think it could indicate stigma towards patients with mental health problems?

Probe: ... lack of interest or confidence in doing mental health care?

Probe: ... lack of time/heavy workload/poor satisfaction with being a CHW in general?

Probe: ... something else?

Additional thoughts:

18. Are there any other qualities specific to individual CHWs themselves you can think of that may predict success in which CHWs can successfully work with patients with mental health problems?

- a. Why is this quality important?

19. Are there any other factors specific to work environments that may be predict success in which CHWs can successfully work with patients with mental health problems?

- a. Why is this factor important?

20. Do you have any other thoughts or comments about what we have talked about today?

Thank you for your help. These are all the questions I have for you today. You have provided us with a lot of useful information during this discussion. Thanks again for your time—we appreciate all of your help.

Aim 2: Role Play Instructions to CHWs

You are a CHW providing support for people who are having a hard time emotionally. The person you are about to meet was referred to you through a community outreach program and you are going to their house to meet them for the first time. This is your first time meeting them. You have no further information about this person. You have approximately 10 minutes to learn about the person and what they are dealing with and engage in a supportive manner. Please use the full ten minutes with this patient, even if you think you might want to ask for help from a supervisor.

Aim 2: General Role Play Instructions for Trained Actor

- Overall tone/presentation:
 - Do not provide your name or personal information unless asked to do so by the CHW
 - Look off to the side or look down when speaking about your problems; take long breaths/sighs and pauses between talking; speak softly
 - Don't tell the CHW right away that you are depressed and have problems with alcohol. Start with something more general like "I have been having a hard time"
 - Do not share about feelings or emotions unless the CHW asks how you are feeling.
 - If the CHW uses closed-ended questions ("*Do you, did you, can you...?*") Respond with short yes/no responses
 - If the CHW uses open-ended questions ("*Please tell me about, please share with me, how did that... etc.?*") Respond with more detailed answers.
 - If the CHW uses technical terms (acronyms, other medical terms, etc...), ask, "What does that mean?" to see if he or she can describe it in lay language.
 - If the CHW asks for feedback on what they are telling you, reply, "Some suggestions are helpful, but some seem too hard for my situation." Then ask if there are other options or activities.
 - If the CHW asks about problems or difficulties in your life, say, "I don't have energy to do anything —this is all my fault"
- Confidentiality:
 - At some point in the ten minutes mention concerns about confidentiality – ex: "My sister is home, I am worried she might hear us." or "Are you going to tell anyone these things that I tell you?"
 - If the CHW does not mention any limits to confidentiality when they discuss confidentiality, reply "Does that mean there are absolutely no times when you will tell anyone anything?"
- Suicidality
 - At some point in the ten minutes tell the CHW "Sometimes I think it'd be easier if I didn't wake up in the morning."
 - If the CHW then asks if you want to die or kill yourself, say "No I wouldn't do that. I want to live for my children."
 - If the CHW then asks if you have ever tried to harm or kill yourself before, say "No I have never tried to do that"
- Unrealistic goals and expectations
 - At some point ask the CHW questions such as, "Will meeting with you help me get a job?"

- If the CHW asks about your goals, say “I must make a lot of money soon (or something else likely unrealistic) if I will make things up to my mother and sister.”

Pre-training Vignette for Trained Actor

Several years ago, you [name] started having a hard time. This started after your father died in an accident. You and he had had a difficult relationship and a big fight soon before he died meant that you were not speaking much at the time of his death. You struggled with feelings of guilt after this and started to go out drinking with friends sometimes so you could get away from home and from thinking about your father. At first, this helped you stop thinking about your problems for a little while. But it also made you feel worse (physically and mentally) the next day, which made it hard to get to work and to clinic appointments and made your mother and your sister worry. Over time you gradually started drinking every night and beginning earlier and earlier in the evening. You stopped doing things that you used to enjoy, like gardening and hanging out with friends. Recently you have sometimes been drinking during the day, which led to you getting fired from your job for showing up drunk. You are anxious about not having taken your ARVs for the past several months but you are also anxious about returning to the clinic because the nurses may be upset with you for not having come to recent appointments. Sometimes you think it might be easier for everyone if you were not around.

Post-training Vignette for Trained Actor

Several years ago, you [name] started having a hard time. This started after you were injured when you were working at a restaurant. You had a hard time with pain after that and had to quit your job to recover. You realized that drinking alcohol could help lessen the pain for a bit and would help you sleep. Over time your alcohol consumption started increasing, until the point that you are having around 5 drinks every day. This has made you feel worse in the morning, but you were already struggling with motivation to get up in the morning since you don't have to be at work. Sometimes you wish you wouldn't wake up at all. You have started cooking and doing household chores less and found yourself getting irritable with your children and friends more. Thinking about not having been to the clinic for a few months for your medication makes you feel guilty, but you can't find the energy to travel there.

Aim 2: Adapted version of the ENACT used in the current study **(English version)**

1. Non-verbal communication

Harmful (1)

- Engages in other activities (e.g. answers phone, completes paperwork while patient is talking about something serious)
- Laughs at client
- Uses inappropriate facial expressions
- Inappropriate physical contact

Some (2) or all (3) basic skills

- Allows for silences (i.e. allows client to finish what they are saying and pauses before starting on something new)
- Maintains appropriate eye contact (note: this would include not making direct eye contact with a person older than them)
- Maintains open posture (body towards client, however crossing arms is ok)
- Continuously uses supportive body language (head nod) and utterances (uh huh)

Advanced skills (4)

- Varies body language throughout session to match client's content and expression

2. Verbal communication

Harmful (1)

- Interrupts client
- Asks many suggestive or leading closed-ended questions (e.g. You didn't really want to do that right?)
- Corrects client (what you really mean...) or uses accusatory statements (you shouldn't have said that to your husband)
- Culturally and age inappropriate language and terms (i.e. intentionally speaking in wrong language)

Some (2) or all (3) basic skills

- Uses open-ended questions
- Summarizing or paraphrasing statements
- Allows client to complete statements before responding

Advanced skills (4)

- Encourages client to continue explaining (tell me more about...)
- Clarifies statements in first person
- Matches rhythm to client's, allowing longer and shorter pauses based on client

3. Explain and promote confidentiality

Harmful (1)

- Not saying anything at all about confidentiality

- Forces client to disclose to self or others
- Describes confidentiality inaccurately (e.g. I will only tell your family)
- Promises full confidentiality with no exceptions
- Minimizes client concerns about confidentiality (e.g. it doesn't matter if anyone hears us)

Some (2) or all (3) basic skills

- Explains concept of confidentiality
- Lists exceptions for breaking confidentiality for self-harm or harm to others
- Explains why it can be important to break confidentiality

Advanced skills (4)

- Asks questions to assess client's understanding of confidentiality
- Topics of discussion are appropriate to confidentiality of setting

4. Rapport building & self-disclosure

Harmful (1)

- Dominates session describing a personal experience
- Minimizes client's problem by describing how the helper has dealt with this
- Asks unnecessary embarrassing personal questions
- Discusses confidential information of other clients

Some (2) or all (3) basic skills

- Introduces self and explains role (note: this can be very casual)
- Makes casual, informal conversation
- Asks for client's introduction (what the client prefers to be called)
- Shares general experience related to the client (about one's community/region)

Advanced skills (4)

- Asks client's reflection on information that helper has shared
- Checks in on client's comfort (offers seat, preferred language)

5. Exploration and normalization of feelings

Harmful (1)

- Makes statements that client's response is unusual or atypical for others in similar situations (people don't usually react this way)
- Minimizes or dismisses client's feelings or emotions
- Forces client to describe emotions

Some (2) or all (3) basic skills

- Appropriately encourages client to share feelings
- Explains that others may share similar symptoms, reactions, and concerns, given similar experiences
- Asks client to reflect on the experience of sharing emotions

Advanced skills (4)

- Explores potential reasons for hesitance to share emotions
- Comments thoughtfully on client's facial expression to encourage emotional expression
- Validates emotional responses while reframing potentially harmful emotional reactions

6. Demonstration of empathy, warmth, and genuineness

Harmful (1)

- Critical of client's concerns (i.e. making statements that show they are judging client for being in this situation)
- Dismissive of client's concerns (says this should not be a concern)
- Helper's emotional response appears inappropriate, fake or acting

Some (2) or all (3) basic skills

- Is warm, friendly, and genuine throughout session
- Continuously shows concern or care for client (that sounds sad, can you tell me more about it?)
- Asks questions to identify what emotions the client was feeling

Advanced skills (4)

- Asks client to reflect on empathetic statements from helper (what did you think when I said you sounded sad?)

7. Assessment of harm and developing response plan

Harmful (1)

- Does not ask about self-harm
- Lectures client with religious or legal reasons against self-harm (this is a sin, or this is against the law)
- Expresses disbelief (eg, accuses client of discussing self-harm to get attention)
- Encourages client to not tell anyone about self-harm or harm to others

All (3) basic skills (note: you cannot score a 2 on this one because we only have one basic skill)

- Indicates that they would like to contact their supervisor to ensure client safety

Advanced skills (4)

- Asks about self-harm or harm to others, or explores harm if raised by client
- Asks about current intent, means, or prior attempts
- Asks about risk and/or protective factors

8. Connect to social functioning and impact on life

Harmful (1)

- Criticizes client for letting symptoms impact functioning (eg, you are weak, you have no willpower)

- Tells client there is no connection between mental health concerns and daily functioning or does not ask about how mental health is affecting daily functioning
- Criticizes client for impact of their problems on children, spouse, or family members
- Makes client feel guilty for impact on children, family, and others

Some (2) or all (3) basic skills

- Asks about daily functioning (sleep, eating, ability to manage responsibilities)
- Discusses the connection (the relationship) between daily functioning and mental health

Advanced skills (4)

- Clarifies and/or supports client's connections between functioning and mental health or reframes as needed
- Explores connection in both directions (daily life to symptoms; symptoms to daily life)
- Asks about history of daily functioning compared to current social context (e.g., How long has this been going on?; COVID19, etc)

9. Explore client's explanation for problem

Harmful (1)

- Criticizes client's view of problem as ignorant, etc.
- Endorses harmful beliefs of client or social network

Some (2) or all (3) basic skills

- Asks about client's view on cause of problem
- Asks about family's or social support network's view on cause of problem (eg, What does your family say caused this?)

Advanced skills (4)

- Incorporates client's perspective of cause in care planning in non-harmful manner
- Discusses alternative to harmful explanations (eg, You said this was because you failed your family, I wonder if there is another way to think about this situation?)
- Addresses differences in client's view of cause and others' view of cause

10. Involvement of family and significant others

Harmful (1)

- Tells client to not involve family or close person(s) in any way during treatment or recovery
- Forces client to involve family or close person(s) in treatment process
- Demands to speak with family or close person(s) without permission from client

- Allows accompanying family member or close person to disempower the client

Some (2) or all (3) basic skills

- Asks about close person(s) in client's life (eg, household members, family, or other)
- Asks client how they would like to involve close person(s) in the care process
- Asks client who they live with

Advanced skills (4)

- Explores client choices or reasons for involving or not involving close, familiar person
- Does role-playing to practice interaction with close person (eg, Helper plays role of family member)

11. Collaborative goal setting

Harmful (1)

- Tells client their treatment goals can't be met, but does not give a reason
- Gives incorrect, misleading, or unrealistic information about treatment goals
- Dictates goals for client (forces goal upon client)
- Focuses on non-mental health related goals instead of mental health related goals

Some (2) or all (3) basic skills

- Asks client about treatment goals and expectations (note: this should focus on mental health or substance use treatment)
- Clearly explains how client's goals and expectations fit with treatment plan

Advanced skills (4)

- Prioritizing and modification of treatment plans to fit client goals
- Works with client to reframe their goals within scope of treatment plan

12. Promotion of realistic hope for change

Harmful (1)

- Makes negative statements about client's doubts (how do you expect to get better if you have no hope?)
- Gives unrealistic expectations (everything will be solved)
- Provides no hope for change (this problem cannot be solved)

Some (2) or all (3) basic skills

- Explains how client can be hopeful about the possibility of change
- Praises client for seeking care

Advanced skills (4)

- Solicits and explores client's doubt about treatment

- Shares reasons for hope based on helper's prior experience or client's behaviors
- Discusses reasons for hope when client is doubtful or dissatisfied

13. Incorporation of coping mechanisms & prior solutions

Harmful (1)

- Makes negative statements about client's coping mechanisms (that would never work...)
- Encourages harmful coping mechanisms

Some (2) or all (3) basic skills

- Asks client about current or past coping mechanisms
- Praises client for positive or safe current or prior solutions

Advanced skills (4)

- Encourages continued use of positive coping mechanisms
- Reflects on prior unhealthy strategies and brainstorms alternatives with client

14. Psychoeducation with local terminology

Harmful (1)

- Uses technical terms (depression, bipolar, schizophrenia) without checking client's understanding
- Uses stigmatizing mental health terms (note they do not have to correct the client if the client uses these terms)

Some (2) or all (3) basic skills

- Conducts accurate psychoeducation using simple terms
- Includes local concepts and terminology into psychoeducation

Advanced skills (4)

- Incorporates client's description of problem
- Checks that client understands psychoeducation

15. Elicitation of feedback

Harmful (1)

- Lectures client about what to do without asking for client's feedback
- Offers negative or harmful suggestions

Some (2) or all (3) basic skills

- Asks for feedback from client to see if any offered suggestions are helpful
- Provides clarifications, reframing, or alternative suggestions based on feedback

Advanced skills (4)

- Summarizes feedback provided by client and checks if interpretation is correct

Mixed Methods Article Reporting Standards (MMARS): Information Recommended for Inclusion in Manuscripts That Report the Collection and Integration of Qualitative and Quantitative Data

Developed from:

Levitt, H. M. (2018). Journal article reporting standards for qualitative primary, qualitative meta-analytic, and mixed methods research in psychology: The APA Publications and Communications Board task force report. *American Psychologist*, 73(1), 26.

<https://doi.org/10.1037/amp0000151>

Paper section or element	Description of information to be reported	Study Information
Title page		
1. Title	- Identify key issues/topic under consideration.	Examining Pre-Training Interpersonal Skills as a Predictor of Post-Training Competence in Mental Health Care Among Lay Health Workers in South Africa
2. Author note	- Acknowledge funding sources or contributors.	“This project was funded by a grant from the National Institutes of Health (NIH): F31MH123020 (Rose). Support was also provided by R34MH122268 (Magidson, Myers), the University of Maryland International Graduate Research Fellowship (Rose), the University of Maryland Department of Psychology Broadening Participation Initiative Dissertation Improvement Grant (Rose), and the University of Maryland Department of Psychology Jack Bartlett Memorial Award (Rose).”
3. Abstract	- State the problem/question/objectives under investigation. - Indicate the mixed methods design, including types of participants or data sources, and analytic strategy, main results/findings, and major implications/significance.	“The first aim of the current study, which uses an exploratory sequential mixed methods design, was to explore qualitative perspectives through semi-structured individual interviews ($n=20$, researchers, policymakers, NGO staff, LHWs) in Cape Town, South Africa on interpersonal skills relevant to delivery of mental health interventions by LHWs. The second aim was to quantitatively examine the preliminary effectiveness of pre-training interpersonal skills in predicting post-training competence following a mental health training among LHWs in Cape Town ($n=26$). Using a standardized LHW assessment measure adapted to the setting, two raters rated ten-

Paper section or element	Description of information to be reported	Study Information
		minute standardized role plays conducted before and after the training for pre-training interpersonal skills and post-training competence. Qualitative findings highlight the perceived importance of and challenges with assessing interpersonal skills among LHWs being trained in psychological intervention. Quantitative analyses did not identify any interpersonal skills as significant predictors of post-training competence. However, interpersonal skills improved during the training itself, specifically verbal communication, suggesting the potential promise of further research in this area. Recruitment of larger samples with more variable training outcomes would be important in future studies examining predictors of LHW competence. Further research may ultimately help identify areas of intervention to support more LHWs in attaining competence and can help play an important role in increasing access to psychological services globally.”
Introduction		
4. Description of research problems/question	- Frame the problem or question and its context. - Review, critique, and synthesize the applicable literature to identify key issues/debates/theoretical frameworks in the relevant literature to clarify barriers, knowledge gaps, or practical needs.	Please see pages 1-10.
5. Study objectives/aims/research goals	- State the purpose(s)/goal(s)/aim(s) of the study - State three types of research objectives/aims/goals: qualitative, quantitative, and mixed methods. Order these goals to reflect the type of mixed methods design. - Describe the ways approaches to inquiry were combined.	“The current study uses an exploratory sequential mixed methods design in which first qualitative data are collected and analyzed to inform subsequent quantitative data collection (Fetters et al., 2013). Therefore, implications for Aim 2 are reported as part of Aim 1 results. These designs are commonly used when researchers aim to develop a new instrument or theory or examine a relationship in a new cultural context, meaning that qualitative work can help illicit new constructs of interest or important considerations for later quantitative data collection (Edmonds & Kennedy, 2023). Specifically, the current study aims to

Paper section or element	Description of information to be reported	Study Information
		understand relationships between pre-training interpersonal skills and post-training competence in delivery of task-shared mental health care among LHWs in South Africa, about which little is directly known. To leverage existing work and local practical expertise in this under-researched area, first we explored qualitative stakeholder perspectives on the role of interpersonal skills in delivering task-shared mental health services in Cape Town, guided by prior research on common factors from a range of settings and our team's preliminary research with LHWs in Nepal. Next, directly informed by qualitative findings from Aim 1, we quantitatively examined the relationship between pre-training interpersonal skills and post-training competence among a group of LHWs in South Africa in the context of a task-shared mental health training. We used updated role play methods for assessment and aimed to control for possible covariates that may also influence training outcomes.” Please also see Figure 2.
Method		
6. Research design overview	- Explain why mixed methods research is appropriate as a methodology given the paper's goals. - Identify the type of mixed methods design used and define it. - Indicate the qualitative approach to inquiry and the quantitative approach used within the mixed methods design type (e.g., ethnography, randomized experiment) - Provide a rationale or justification for the need to collect both qualitative and quantitative data and the added value of integrating the results (findings) from the two databases.	Please see above. Semi-structured individual interviews (qualitative) and pre-post comparison of behavioral coding of standardized role plays (quantitative).
7. Participants or other data sources	- Provide the numbers of participants/documents/events analyzed.	Exploratory sequential mixed methods: qualitative methods and results reported first.

Paper section or element	Description of information to be reported	Study Information
	- Describe the demographics/cultural information, perspectives of participants or characteristics of data sources that might influence the data collected. - When data are collected from multiple sources, clearly identify the sources of qualitative and quantitative data (e.g., participants, text), their characteristics, as well as the relationship between the data sets if there is one (e.g., an embedded design). - State the data sources in the order of procedures used in the design type (e.g., qualitative sources first in an exploratory sequential design followed by quantitative sources), if a sequenced design is used in the mixed methods study.	Aim 1 (qualitative): $n=20$ semi-structured individual interviews. Please see Table 3 for characteristics. Aim 2 (quantitative): $n=27$, with $n=26$ complete sets of pre-post role plays available. Please see Table 4 for characteristics.
8. Researcher description	- Describe the researchers' backgrounds in approaching the study, emphasizing their prior understandings of the phenomena under study (e.g., interviewers, analysts, or research team). - Describe how prior understandings of the phenomena under study were managed and/or influenced the research (e.g., enhancing, limiting, or structuring data collection and analysis). - Describe the relationships and interactions between researchers and participants relevant to the research process and any impact on the research process (e.g., was there a relationship prior to research, are there any ethical considerations relevant to prior relationships).	Reflexivity statement: "This research took place in peri-urban Cape Town, South Africa, in areas originally developed under the apartheid government and still highly racially segregated and under-resourced. Power dynamics and racial oppression are highly relevant contextual factors within all research conducted in Cape Town. This study was led by a White American Clinical Psychology doctoral candidate who had worked in South Africa for over four years and in cross-cultural research and health care implementation in central and southern Africa for over eight years. Other team members included White senior researchers from the United States and South Africa with expertise in psychological intervention, a Black American Master of Public Health student, and Black and mixed-race South African research assistants with experience in mental health research and from the area of Cape Town in which this research took place. Though choices were ultimately made by the lead graduate student, because this was a dissertation study, efforts were continuously made throughout the process of designing and implementing this research and analyzing data to shape decisions based on input from South African research assistant

Paper section or element	Description of information to be reported	Study Information
		team members. Throughout, we have aimed to reflect upon and explore ways in which our personal identities were influencing our approaches and privilege the perspectives of team members with the greatest knowledge of and connection to the context.” Aim 1: “Stakeholders and CHWs who participated in qualitative interviews for these two larger studies ($N=40$) were eligible for inclusion in Aim 1 of the current study if they were interested in conducting a further follow up interview. Therefore, participants had in some cases met the interviewer before, in the context of a prior research interview.” Aim 2: “The trained staff member in the current study had experience delivering task-shared interventions, was from the local area, and was minimally involved in delivering the training... Using the video recording of each completed role play, trained staff members with experience delivering or supervising task-shared interventions and who were from the local area rated each participant using the ENACT... Two raters were minimally involved in providing the training itself and one rater was not involved in the training at all.”
Participant recruitment		
9. Participant sampling or selection	- Describe the recruitment process (e.g., face-to-face, telephone, mail, e-mail, recruitment protocols). - Describe any incentives or compensation, and provide assurance of relevant ethical processes of data collection and consent process as relevant (may include institutional review board approval, particular adaptations for vulnerable populations, safety monitoring).	Aim 1: “From within the original sample, $n=22$ participants were purposefully approached by telephone to ensure representation of different roles and organizations and based on the expected sample size to reach theoretical saturation (Hennink & Kaiser, 2022). Therefore, participants had in some cases met the interviewer before, in the context of a prior research interview. Two CHW managers declined to be interviewed due to lack of time in their schedule³ and

³ The two participants who declined interviews due to workload did not noticeably differ from enrolled participants on demographics.

Paper section or element	Description of information to be reported	Study Information
	- Describe the process via which the number of participants was determined in relation to the study design. - Provide any changes in numbers through attrition and final number of participants/sources (if relevant, refusal rates or reasons for dropout). Describe the qualitative and the quantitative sampling in separate sections. - Relate the order of the sections to the procedures used in the mixed methods design type	$n=20$ interviews were conducted. Participants received a 150 rand (~ 8 USD) honorarium for the interview, which took about an hour. Approval for the study was obtained from the South African Medical Research Council Human Research Ethics Committee under an Institutional Review Board Authorization Agreement with the University of Maryland College Park Institutional Review Board. After fully explaining procedures to participants, written informed consent was obtained. Aim 2: “Like Aim 1, Aim 2 was embedded within a larger study on mental health and substance use stigma reduction among CHWs being conducted in partnership between the University of Maryland and the South African Medical Research Council. In the larger study, all interested CHWs ($N=82$) from partner NGOs in Cape Town were recruited to receive training in task-shared mental health in a stepped wedge design. Only CHWs participating in the first cluster of this larger stepped wedge study (an estimated $n=30$) were enrolled in the current study, both to ensure feasibility of data collection and because of the estimated sample size needed for planned analyses. Based on the effect size seen in the preliminary study, power analyses conducted in G*Power 3 estimated 92% power at the 0.05 significance level with $n=30$ CHWs. No honorarium was provided, as attending trainings is a standard component of CHW roles, but refreshments were provided on training days... Ethics approval was obtained from the South African Medical Research Council Human Research Ethics Committee... Twenty-seven individuals participated in the training. The role play recording was corrupted for one participant, and the analytic sample was therefore $n= 26$.”

Paper section or element	Description of information to be reported	Study Information
		Qualitative methods reported first.
10. Participant recruitment	- Describe the participants/data sources selection process (e.g., purposive sampling methods such as maximum variation, diversity sampling, or convenience sampling methods such as snowball selection, theoretical sampling), inclusion/exclusion criteria. - Discuss the recruitment strategy for qualitative and quantitative research separately in mixed methods research.	Aim 1: Purposive sampling within an existing purposive sample, based on the expected sample size for theoretical saturation. Aim 2: Subset of all participants included from partner NGOs to ensure feasibility for a dissertation and based on necessary sample size for planned analyses. Recruitment strategies reported separately.
Data collection		
11. Data collection/identification procedures	- State the form of data collected. - Describe the data selection or collection processes. - Describe questions used in data collection.	Aim 1: Responses to interview guides in English or isiXhosa, translated if needed, and then transcribed. Please see interview guides in supplemental materials. Aim 2: Paper measures (demographics, covariates) collected in isiXhosa or English. Role plays conducted in isiXhosa and rated using a standardized measure that had been translated to isiXhosa. Please see English version of rating tool included in supplemental materials.
12. Recording and transforming of data	- Identify data audio/visual recording methods, field notes, transcription processes used.	Aim 1: Recording function in Microsoft Teams. Files stored on secure UMD server. Aim 2: Paper measures: securely stored in locked cabinets and entered into REDCap database. Videos: Recording function on a Samsung tablet. Video files stored on secure UMD server.
13. Data analysis	- Describe the methods and procedures used and for what purpose/goal. - Indicate software, if used. - Devote separate sections to the qualitative data analysis, the quantitative data analysis, and the mixed methods analysis. This mixed methods analysis consists of ways that the quantitative and qualitative results will be “mixed” or integrated according to the type of mixed methods design being used (e.g.,	Aim 1: Please see pages 16-17. Implications for Aim 2: Please see pages 17-18. Aim 2: Please see pages 26-27. Separate sections describing Aim 1 (qualitative analysis), implications for/connection to Aim 2, and Aim 2 (quantitative analysis)

Paper section or element	Description of information to be reported	Study Information
	merged in a convergent design, connected in explanatory sequential designs and in exploratory sequential designs).	
14. Validity, reliability, and methodological integrity	- Indicate methodological integrity, quantitative validity and reliability, and mixed methods validity or legitimacy. Further assessments of mixed methods integrity are also indicated to show the quality of the research process and the inferences drawn from the intersection of the quantitative and qualitative data.	Qualitative validity supported by inclusion of stakeholders from different organizations and with different roles, detailed description of methods and analyses, coding by two independent coders using a coding framework, resolution of discrepancies through discussion, minimum inter-rater reliability, and use of quotes to support findings. Quantitative validity supported by use of a measure designed for assessment of LHWs within task-shared mental health training, obtaining training from the original study team on conducting data collection and rating using this measure, detailed description of methods, including adaptation, and analyses, and use of consensus between raters to finalize ratings. Mixed methods validity supported by strong rationale for qualitative data collection preceding quantitative data collection and use of MMARS guidelines for reporting.
15. Findings/Results	- Describe research findings. - Indicate how the qualitative and quantitative results were “mixed” or integrated (e.g., discussion, tables of joint displays, graphs, data transformation in which one form of data is transformed to the other, such as quantitative text, codes, themes are transformed into counts or variables).	Please see pages 28-43. Qualitative results were connected to quantitative findings through identification of implications for Aim 2 as part of Aim 1 analyses. These results are reported on pages 36-39.
16. Discussion	- Describe the central contributions and their significance in advancing disciplinary understandings. - Describe the types of contributions made by findings (e.g., challenging, elaborating on, and supporting prior research or theory in the literature describing the relevance) and how findings can be best utilized.	Please see pages 44-56.

Paper section or element	Description of information to be reported	Study Information
	- Identify similarities and differences from prior theories and research findings. - Reflect on any alternative explanations of the findings. - Identify the study's strengths and limitations (e.g., consider how the quality, source, or types of the data or the analytic processes might support or weaken its methodological integrity). - Describe the limits of the scope of transferability or generalizability (e.g., what should readers bear in mind when using findings across contexts). - Revisit any ethical dilemmas or challenges that were encountered, and provide related suggestions for future researchers. - Consider the implications for future research, policy, or practice.	

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