

Training and Supervising Lay-providers in Low-income Settings: A Mixed-methods Study of
Task-sharing from the Shamiri Randomized Controlled Trial

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Objective: Training lay-providers to deliver mental health interventions is both effective and cost-effective. However, more research is needed to document training and supervision procedures and to collect lay-providers' feedback. We analyzed the acceptability of a 10-hour lay-provider training and supervision delivered primarily by undergraduates. We also tested lay-provider fidelity and quality. **Methods:** This study documents training and supervision from an RCT of the Shamiri intervention, a 4-session, school-based intervention which significantly reduced symptoms of anxiety and depression in Kenyan adolescents. We delivered a 10-hour training to 13 lay providers ($M(SD)_{age}=21.00(1.95)$, $\%_{female}=61.54$). We also hosted 30-minute supervision meetings twice weekly. Independent raters coded session recordings for fidelity and quality. We also collected quantitative and qualitative feedback from lay-providers. **Results:** Reliability and mean ratings for all six of our fidelity and quality measures (delivering required content, adhering to specified details, thoroughness, skillfulness, clarity, and purity) were very good to excellent. Lay-provider quantitative ratings of training were also overwhelmingly positive, with an overall satisfaction rating of 6.46/7.00. We identified central qualitative themes in lay provider comments: Generally, comments about training style, content, and personal interactions were overwhelmingly positive, and many lay-providers reported personal growth. Comments about timing and location were mixed. **Conclusions:** This study provides preliminary evidence that a very brief training delivered primarily by undergraduates can teach high-school-graduate lay-providers to deliver effective mental health interventions. Additionally, we discuss lessons-learned and implications for future research, including the importance of considering local context when planning and of continuously collecting and addressing lay-provider feedback.

Keywords: Task-sharing, Global Mental Health, Training, Supervision, Implementation

Public Significance Statement

This study provides preliminary evidence that very brief, scalable lay-clinician training programs could help increase access to effective mental health care in low-income regions. We provide details about procedures used to train and supervise lay-people in delivering an effective intervention for Kenyan adolescents. In addition, the feedback we provide from participating lay-providers can inform future efforts to design and implement brief training and supervision procedures for lay-providers in low-resource settings.

Introduction

Mental disorders are prevalent and debilitating worldwide, yet, for those suffering from mental disorders in low- and middle-income countries (LMICs), treatment options are severely limited by a paucity of trained caregivers, high treatment costs, and elevated stigma (Ndetei et al., 2016; Patel et al., 2007). In Kenya specifically, rates of mental disorders appear high, with up to 37.99% of adolescents reporting clinically elevated anxiety symptoms and 45.90% reporting clinically elevated depression symptoms (Osborn et al., 2020). Yet, Kenyan adolescents, like their counterparts in many other LMICs, face several barriers to accessing evidence-based treatment. First, there is increased stigma around mental health, which limits their help-seeking behavior (Ndetei et al., 2016). Second, low incomes and minimal government investment in mental health issues (estimated at \$0.20 per capita) inhibit access to treatments (Caddick et al., 2016). Finally, there is a severe shortage of trained mental health specialists in Kenya, with only 1.8 psychiatrists per million citizens (*GHO | By category | Human resources—Data by country*, 2019). Under these circumstances, it would be impossible to fulfill mental health needs solely by using traditional evidence-based treatments which are typically long, costly, and delivered by trained clinicians (Schleider & Weisz, 2017a, 2017b; Weisz & Kazdin, 2017).

Given these treatment barriers, developing scalable, non-stigmatizing, and cost-effective treatment methods for mental disorders is a key priority in global mental health research (Collins et al., 2011). Several alternative methods of delivery show promise for overcoming these barriers, including task-sharing, in which lay-providers with little-to-no mental health background provide care with training and supervision by psychologists (Hoeft et al., 2018). What we refer to as lay-providers, also called community health workers, are normal civilians without formal mental health training. They are typically members of the local community who

receive training and supervision from mental health professionals in order to deliver treatment either in place of clinicians or adjunctively. The use of lay-providers to deliver evidence-based treatments has become increasingly popular in recent years, particularly because they may be helpful for treating mental disorders in LMICs where there are few professionally trained mental health providers.

Previous studies in LMICs suggest that psychosocial interventions implemented by lay-providers can be effective, cost-effective, non-stigmatizing, and accessible (Singla et al., 2017). Many published trials using lay-providers have shown significant symptom improvements, and some meta-analytic evidence suggests that interventions led by lay-providers have generated effects comparable to those of interventions led by psychotherapy students and professionals (Barnett et al., 2018; Weisz et al., 1995). This is true for a diverse array of populations and problem types. For example, a peer-group, lay-provider delivered intervention for AIDS-orphaned youths in Uganda significantly reduced symptoms of anxiety and depression relative to a control group (Kumakech et al., 2009), and a lay-provider-led intervention significantly reduced symptoms in those with alcoholism in Goa, India (Nadkarni et al., 2015). Additionally, lay-providers are typically members of the communities in which they work, which makes their services more accessible and helps position them to offer culturally appropriate care that may be less stigmatizing than what outsiders can provide (Balaji et al., 2012). Of course, not all lay-provider delivered mental health interventions have proven effective (e.g., Tol et al., 2014). Although lay providers offer many advantages (e.g., cost-effectiveness, decreased stigma, accessibility, increased connection with clients), there also are several risks and drawbacks to the use of lay-providers. These include the lack of extensive training and clinical experience and the logistical and monetary challenge of balancing “day jobs” with work as a lay-provider (Musyimi

et al., 2017; Rustagi et al., 2015). To mitigate these risks of employing lay-providers, it is important to provide them with thorough and culturally appropriate training and supervision.

Few reports to date have provided detailed, replicable training and supervision procedures (Barnett et al., 2018; Murray et al., 2011), but several have outlined potentially useful components. Past research has emphasized 1) the importance of lay-provider role-play practice, 2) consistent opportunities for open group discussions, 3) involvement of lay-providers in intervention design, 4) continued supervision involving local study team members, and 5) provision of tangible feedback from lay-providers and the study team throughout intervention training and delivery (Murray et al., 2011; Verdeli et al., 2003; Verdeli et al., 2008). For example, Murray et al. 2011 describe an “apprenticeship” model used successfully to train over 100 lay-providers in 12 countries. This model is designed to promote clinician fidelity and competency in large part through continued post-training supervision throughout intervention delivery. Additionally, many lay-provider trainings emphasize role-playing with about one hour of supervised role-plays in small groups for every 30 minutes of trainer didactics (Murray et al., 2011; Verdeli et al., 2003). Finally, some past research has highlighted that the lay-providers are and should be treated as important members of the team. Furthermore, because they are highly attuned to the cultural context, they should be asked for their feedback on study procedures (Verdeli et al., 2003).

Recent research has pointed to several important future directions in research on lay-provider-delivered interventions. First, several recent reviews have pointed out that very few studies report details of training and supervision procedures and have called for greater reporting of training and supervision procedures (Barnett et al., 2018; Murray et al., 2011). Second, the fact that most studies have not reported intervention fidelity inhibits our ability to assess training

and supervision effectiveness (Singla et al., 2017; Barnett et al., 2018). Third, time-limitations are well-established as a barrier to employment of lay-providers (Ferrinho et al., 2012; Murray et al., 2011), thus, there is need for development of brief, efficient, and scalable training and supervision procedures. Fourth, researchers would benefit from lay-provider feedback on training and supervision procedures to guide improvements in intervention acceptability and effectiveness from the perspective of the trainees.

We built on these ideas in developing a training and supervision procedure to prepare lay providers to deliver a group-administered mental health intervention to adolescents in Kenya. We applied the principles in a novel way that may have value for future research efforts: Our training and supervision procedure was designed and implemented largely by undergraduates. With advisory support available from doctoral level professionals, the two lead-trainers were undergraduates, as were all the members of the team running training and supervision except for one masters student. To our knowledge, this is the first time a lay-provider mental health training has been led by undergraduates. Additionally, this is, to the best of our knowledge, one of the first trials to employ recent high-school graduates. This method of delivery, if it continues to prove effective, may increase feasibility and scalability of lay-provider training.

Current Study

This present study provides a description and evaluation of the protocol for lay-provider training and supervision procedures implemented during a randomized controlled trial of the *Shamiri* (“thrive” in Kiswahili) intervention for adolescents (Osborn, Venturo-Conerly, et al., 2019). This intervention consists of four one-hour sessions, each delivered to a group of 8-12 students in Kenyan high-schools. *Shamiri* is made up of three positively-focused modules selected for their efficacy in past research, their cultural appropriateness, and their brief nature:

growth mindset, gratitude, and value affirmations. In this randomized controlled trial (N=413; mean [SD] age, 15.47[1.20] years; 268[65.21%] female), the Shamiri intervention produced significant reductions in anxiety and depression relative to an active control condition, and these beneficial effects were sustained in a 7-month follow-up assessment (Osborn, Wasil, et al., 2019). Importantly, the lay-providers in this study (described further in Methods) were all recent graduates of Kenyan high schools, and none reported any formal health training prior to this study. In the present paper, we document and evaluate the training and supervision procedures associated with these strong intervention effects.

In this training and supervision program, the researchers employed several strategies and frameworks indicated by past research (e.g., role-playing, continued supervision and feedback; see (Murray et al., 2011; Verdeli et al., 2003; Verdeli et al., 2008). Additionally, the protocols were designed within the framework of community-based participatory research (Jones & Wells, 2007) and using an iterative design. Specifically, the study team included several core members from Nairobi (the fourth-eighth authors), and in training and supervision, the team regularly requested and acted on feedback from the local lay-providers. Additionally, lay-providers, students, teachers, and researchers based in Kenya and the United States contributed to the design of the intervention, training, and supervision procedures over the course of nearly two years (see Osborn, Wasil, et al., 2019 for more on the pilot trial of this intervention, including the training procedure). Most importantly, the training from the pilot trial lasted for five days (as opposed to just two in the present study) and included no formal supervision procedures.

Although there is past research supporting the effectiveness of lay-provider delivered treatments, to the best of our knowledge, this is the first study in which lay-providers were trained to deliver a brief intervention for adolescents with a positive, non-stigmatizing focus in a

low- or middle- income country. Furthermore, it is one of very few studies to provide detailed protocols for training and supervision, and to provide participant feedback on training and supervision. Finally, this study offers an example of a training that took place over the course of only ten hours. This is considerably shorter than many lay-provider trainings, which, according to a recent review, average 78.82 hours (Singla et al., 2017). Thus, we expect that this training may serve as a helpful case study in very brief trainings. In the methods section, we provide a detailed description of training and supervision procedures. In results, we discuss outcomes indicating lay-provider performance, and quantitative and qualitative feedback on training and supervision offered by our lay-providers.

Methods

Overview

Below, we detail methods for selecting the lay-providers, for training the lay-providers over the course of 10 hours, and for supervising the lay-providers via weekly meetings and regular messaging via WhatsApp. This is the first large-scale trial of a lay-person-delivered positive-psychology-based intervention in a LMIC, and protocols for selection, training, and supervision may be useful to researchers, local providers, policy-makers, and others seeking to implement similar interventions in comparable settings. Specifically, training and supervision were implemented by a team of seven people. These procedures were led by two undergraduates (the first and second authors). Another four undergraduates (one of whom is the fourth author) and one masters student were regularly involved in training and on-the-ground supervision. Additionally, several doctoral-level researchers and clinicians (the last five authors) served as advisors to these students and assisted in designing and supervising the procedures described. The qualitative feedback collected from the participating lay-providers (see Results), also

provides information about the efficacy and acceptability of the training protocol. Future researchers may learn from the strengths and weaknesses of this procedure and better design their own selection, training, and supervision procedures.

Selection of Lay-Providers

Recruitment

Recruitment messages were sent by local study team members and their local contacts to WhatsApp group chats, university online forums, and job posting boards. These messages provided a simple description of the study and the lay-provider role (referred to as “group leader” in all recruitment materials) and asked interested lay-provider candidates to fill out a brief online application form. The form confirmed their eligibility and availability via self-report (e.g., “Have you graduated from high school?”) and asked minimal questions about past experiences and interest (e.g., “Briefly, what skills or personal qualities would you want to develop or improve if you worked as a Shamiri Wellness Program peer group leader this summer?”). Because some applicants had better internet access and more time than others, responses on this form were only used to screen out those potential candidates who did not meet inclusion criteria, who were not available during the study period, or who seemed a very poor fit for the role. Out of 36 online applications, 18 people attended in person interviews (see CONSORT). Criteria for selection were primarily assessed in in-person interviews, detailed in the following section.

In-Person Interviews

Interviews with these candidates were 30 minutes each and were standardized according to a script. Four members of the study team, including the first and second authors, were present

for all interviews. The interview questions assessed interest in the position, personal characteristics, and past experiences with group leadership, teaching, and adolescents. Interviewees were also asked to speak about their awareness of the issues facing Kenyan secondary school students and to talk through hypothetical scenarios that often arise when leading groups (i.e., students not talking enough, one student dominating the conversation, and situations arising that are beyond what the lay-provider is prepared to handle). The interview script is available in supplementary materials. All candidates were evaluated according to a standardized rubric used by all interviewers (see supplemental materials), followed by a team discussion. This rubric included ratings of interest, experience, availability, perceived ability to lead groups, and ratings of perceived personal characteristics that would be important for leading groups (e.g., comfortable presence). Upon completion of all interviews, the study team convened to discuss which lay-providers to hire. Rubrics were used in this discussion as a guide; the team discussed each candidate holistically, with emphasis on the candidates' responses to hypothetical scenarios. In most cases, the study team agreed readily on which candidates to hire. In the few cases in which decisions were more challenging (i.e., selecting the last few, lower-scoring lay-providers), a member of the team who was not present in interviews helped lead discussion. This discussion involved reviewing rubrics and focused on candidates' responses to hypothetical scenarios and on their personal characteristics, particularly comfortable presence. In the end, all members of the study team agreed on the accepted lay-providers. The accepted lay-providers were notified via email and phone calls. All invited accepted their positions.

Compensation

Previous research has pointed to the importance of freeing lay-providers from other responsibilities such that they can devote time and energy to intervention training and delivery

(Murray et al., 2011). One benefit to employing recent high school graduates during the summer was that most of them did not rely heavily on other jobs for income yet, nor were they occupied with university – nonetheless, we provided a stipend of \$150 (a salary more-than-sufficient to support cost-of-living during the intervention period in the Nairobi area), and we fully reimbursed transportation related to the intervention.

Training Procedures

Training took place in 10 hours spread over two days (one weekend) and was delivered by members of the study team, primarily by the first and second authors. Importantly, all training procedures and materials described below are available in full in supplementary materials. In the Shamiri pilot trial (Osborn, Wasil, et al., 2019), training took place over a full work-week, but in this fully-powered RCT, training was shortened considerably to promote ease of implementation. All of the same components were covered in this shortened training (i.e., counseling techniques, techniques for group leadership, emergency procedures, intervention didactics, and intervention role-plays). However, several strategies were used to shorten training, including: spending more time on role-plays relative to didactics, having each lay-provider only complete one ~30 min role-play of intervention content but participate as a “group member” in role-plays of all content, and using supervision meetings to review program content weekly.

Training occurred at the study team headquarters, where much of the team lived; lunch and drinks were provided. Training opened with an hour introduction to the study including ~20 minutes of ice breakers. Then, the team spent approximately one hour on pure didactics, describing rules and expectations. For the next eight hours of training, the lay-providers practiced role-playing peer counseling skills and role-playing the intervention and control sessions. As a time-saving measure, they spent more time role-playing the wellness intervention

condition, which, the study team explained (accurately), was because this content was more sensitive and unfamiliar than the control (which focused on study skills). Importantly, in order to avoid bias, the investigators omitted the fact that the Study Skills Control condition was a control condition. Instead, the investigators said that we were testing the two conditions against each other to determine their relative effects on wellbeing and academic performance. Finally, throughout the training, the trainers emphasized their willingness to answer any and all questions, their gratitude toward and belief in the lay-providers, their desire for participation from the lay-providers, and the fact that the training was designed to be a space in which all could feel comfortable participating and learning.

Didactics

During the one-hour didactics portion of the training, the study team discussed lay-provider expectations and offered the lay-providers opportunities to clarify these expectations and plans. Specific topics covered included: 1) logistical details about the study including transport and compensation, 2) privacy and confidentiality, especially of the students participating in the study, 3) the scientific nature of the study, 4) the importance of following the provided protocols, and the importance of not mixing condition protocols, 4) plans for weekly supervision 5) the importance of data security and of immediately giving any activities or measures completed by the students to the study team after each session, 6) emergency procedures in the event that a student mentioned suicidality or another serious concern arose. In brief, the emergency protocol called for lay-providers to alert the study team in two scenarios: 1) if they suspected that any participants had thoughts of, plans to, or intent to harm themselves or others, and 2) if they felt any issue related to the participants or study was difficult for them to handle alone. See supplementary materials for the full emergency protocol.

Role-plays

The first two hours of role-plays were devoted to practicing peer counseling techniques. The study team members began with a brief didactic portion, in which they introduced peer counseling techniques, such as validating, asking open-ended and follow-up questions, rephrasing, and verbal nodding. For each peer counseling tactic, a study team member described the technique and gave an example of a case in which it could be used. Then, each lay-provider was asked to give one example of that technique before moving on to the next. For example, when discussing the concept of “validation,” each lay-provider gave an example such as, “yeah, that sounds really tough.”

After discussing peer counseling techniques, lay-providers split into groups of two to practice peer-counseling through role-plays (one acted as the counselor and the other as the counselee). These role-plays were not related to the intervention content; rather, they were intended only to practice peer counseling techniques. The study team watched the role-plays and gave feedback. In order to provide feedback, the study team first asked other group leaders what they thought went well in each role play and what could be improved. The team then offered their own list of positives and areas for improvement. After these role-plays, all the participants in training discussed what they learned. Finally, the study team discussed with the lay-providers general skills for group leadership: how to keep discussions on track, how to keep time during the sessions, how to ensure that everyone has a chance to participate, and how to respond if an emergency or something unexpected arises in a group.

The bulk of the training (six of the ten hours) was spent on study protocol role-plays. The lay-providers practiced one of these role-plays during the first day and the rest during the second day. Lay-providers were asked to study the protocols before the second day. To practice role-

plays, they were split into two equally sized groups, each supervised by two members of the study team. Within each group, each leader volunteered to deliver the bulk of one session (approximately thirty minutes, skipping the time necessary for students to complete in-session activities) to practice in front of the group. Other lay-providers were asked to participate as students, while study team members watched and took notes for feedback. After each role-play, the group had approximately ten minutes to discuss feedback (from the study team members and from fellow lay-providers) and ask questions.

After each lay-provider had completed a role-play and received feedback, the entire group of lay-providers and study team members reconvened for twenty-five minutes to discuss common challenges and tips (discussed further in the discussion section). To facilitate discussion, the trainers asked questions such as, “what was some helpful feedback you received?” and “what were some common challenges that came up in your group?” Lay-providers were given the opportunity to ask questions or make comments in the last few minutes before training concluded. All the lay-providers except one performed adequately in the training role-plays. The lay-provider who did not perform adequately was privately asked to practice and have a 30 minute follow-up call with the two lead trainers. In this call, they practiced another role-play over the phone. In this follow-up role play, the lay-provider performed well and was deemed prepared for the sessions. For the full training protocol, see supplementary materials.

Supervision

Previous research has pointed to the importance of continued supervision post-training to ensure that lay-clinicians continue to properly implement evidence-based protocols and feel supported in case difficulties and uncertainties arise (Murray et al., 2011). Therefore, we aimed to integrate structured and consistent supervision procedures into weekly intervention-delivery

structures (i.e., before or after intervention-delivery at schools) and existing communication channels (i.e., WhatsApp).

Weekly Supervision

Supervision meetings were ~30 minutes each, occurred twice a week, and included all available members of the study team and all lay-providers. For convenience, these meetings occurred at secondary schools immediately prior to beginning sessions. These meetings were used for two main purposes: 1) To review the sessions that would take place during that week, and 2) to address any concerns that the lay-providers had faced in their groups during the past week. For the first type of meeting, lay-providers were divided into small review groups in which they discussed and practiced the upcoming week's content. All lay-providers were encouraged to ask questions of their assigned supervisor for the day. This review helped ensure that lay-providers remembered and adhered to the week's intervention and control content. Meetings to discuss concerns from the past week occurred on the last day of each week and were intended to provide lay-providers with a structured time to voice concerns and questions and to learn from each other and the study team. Additionally, these meetings helped the study team stay informed about any issues they needed to address.

Daily Supervision

In addition to weekly supervision meetings, each lay-provider was assigned a daily supervising member of the study team at each school. This member of the study team provided their assigned lay-providers with materials, collected materials from the lay-providers after the sessions, gave the lay-providers time warnings, and were available for the lay-providers if they had any questions or concerns during the groups. Importantly, the supervisors were present in the

general area, but did not linger near the groups nor listen to any conversations. Finally, the study team used WhatsApp to send the lay-providers important reminders (e.g., plans for the next day).

Fidelity and Performance Ratings

Recordings of a randomly selected 10% of sessions (19 sessions) were coded by two independent raters unaffiliated with the study team. They were provided with a fidelity and performance rubric, and independently rated each recording out of 7 (with 1 being the worst performance and 7 being the best) for six fidelity and performance measures (delivering required content, adhering to specified details such as passing out sheets, thoroughness, skillfulness, clarity and accessibility, and purity, or not adding any content other than that specified in the relevant protocol). Reliability for fidelity ratings was calculated using Gwet's second AC statistic (AC2), which is less affected by marginal probability and prevalence than Cohen's kappa. It is therefore optimal for use with ordinal rating data with high variation in marginal probability (e.g., this present dataset in which ratings reflecting very low performance were never used while ratings reflecting good performance were often used) (Gwet, 2008; Wongpakaran et al., 2013). We used the `rel` package in R and employed quadratic weighting to reflect greater agreement closer to the diagonal (e.g., paired ratings of 2 and 6 reflect worse agreement than paired ratings of 5 and 6). For the full document detailing the fidelity rubric, see supplementary materials.

Lay-Provider Feedback

Feedback Collection

The study team collected a feedback form on the training at two timepoints, immediately post-training and immediately after the last group sessions) and on supervision immediately after

the last group sessions. All feedback was collected anonymously. Quantitative questions asked about the quality of preparation for sessions, usefulness, comfort, clarity, and overall impressions (e.g., “On a scale from 1-7, 1 being extremely unprepared and 7 being extremely prepared, how well do you feel that the training prepared you to lead the sessions?”). Qualitative questions asked about strengths and weaknesses of the trainings and supervision (e.g., “Based on your experience with the training and supervision meetings, what do you think should be kept the same about training and supervision?”). For the full feedback forms, see Supplementary Materials.

Qualitative Analysis

Qualitative responses were coded for content according to principles of thematic analysis (Braun & Clarke, 2006). The first and second author created the codebook in an iterative process – first, they independently generated codebooks based on the responses, then compiled and refined their codebooks. Once the two coders had generated a final codebook, they applied it to a random selection of seven responses (~30% of responses) and independently coded these responses. They achieved good interrater reliability for all codes, with Cohen’s kappa between 0.70 and 1.00. Once the two authors achieved reliability, the first author coded all remaining responses to classify their content.

Results

Sample Characteristics

Eligible lay-providers met the following criteria: 1) at least 18 years old; 2) completed high school in Kenya, for which the official language of instruction is English; 3) able to read

intervention protocols in English (all Kenyan high school graduates would meet this criteria, nonetheless, this was also assessed via ability to complete a brief online application written in English), and 4) available at all the scheduled group intervention times (assessed via online application and interviews). The study team selected 12 applicants who met these four criteria. We also trained a local study coordinator who met these four criteria, such that the study coordinator could fill in for a lay-provider in case of an emergency (i.e., in three instances of illness and one of a transportation emergency). Past research suggests that qualitative studies reach thematic saturation at or before a sample size of 12 (Crouch & McKenzie, 2006; Guest et al., 2016); therefore, our sample size of 13 participants should allow us to detect important themes. See Table 1 for full participant demographic information and Figure 1 for CONSORT.

Fidelity and Performance Ratings

Based on Gwet's AC2, reliability for the two raters was in the very good to excellent range on all domains (Wongpakaran et al., 2013). Average ratings were relatively high on all six domains of fidelity and performance. Additionally, t-tests revealed that there were no significant differences in fidelity or performance across the intervention and control groups. Reliability (AC2) and performance was as follows for the six domains: delivering required content (AC2 =.84 , $M_{\text{overall}}=6.65/7.00$, $M_{\text{intervention}}=6.55$, $M_{\text{control}}=6.78$, $p=.26$), adhering to specified details (e.g., passing out sheets) for each session (AC2=.87, $M_{\text{overall}}=6.76/7.00$, $M_{\text{intervention}}=6.80$, $M_{\text{control}}=6.72$, $p=.75$), thoroughness (AC2=.95, $M_{\text{overall}}=6.18/7.00$, $M_{\text{intervention}}=6.35$, $M_{\text{control}}=6.00$, $p=.10$), skillfulness (AC2=.95, $M_{\text{overall}}=6.03/7.00$, $M_{\text{intervention}}=6.15$, $M_{\text{control}}=5.89$, $p=.32$), clarity and accessibility (AC2=.96, $M_{\text{overall}}=6.26/7.00$, $M_{\text{intervention}}=6.40$, $M_{\text{control}}=6.11$, $p=.23$), and purity (i.e., not adding content not explicitly in a given protocol) (AC2 =.84, $M_{\text{overall}}=6.11/7.00$, $M_{\text{intervention}}=6.20$, $M_{\text{control}}=6.00$, $p=.60$).

Lay-Provider Feedback: Quantitative Ratings

Overall, ratings of training, both immediately post-training (M=6.46/7.00, SD=0.78) and after the interventions were completed (M=5.90/7.00, SD=0.87), were adequate, indicating that lay-providers were generally satisfied with training. Additionally, lay-providers seemed to believe that the training prepared them well to lead the groups both immediately after training (M=6.31/7.00, SD=.48) and after the interventions were completed (M=6.50/7.00, SD=0.52). Additionally, supervision sessions were rated adequately on all domains, including overall efficacy (M=6.00/7.00, SD=0.81) and preparedness for sessions due to supervision (M=6.10/7.00, SD=0.99). For more detailed ratings of training and supervision, including ratings of comfort, respect, and clarity, see Table 2.

Lay-Provider Feedback: Qualitative Themes

We identified five major themes mentioned by lay-providers in feedback immediately post-training and post-intervention: 1) Interpersonal interactions, a theme including comments about interactions with the study team and other lay-providers, 2) Training style, a theme including comments about how the training content was delivered, 3) Training logistics and timing, a theme including comments about the logistical and scheduling aspects of training, 4) Training content, a theme including comments about the content of training and supervision, 5) Expressions of positivity/personal growth, a theme including comments expressing appreciation and describing experiences of personal growth related to participating in training and supervision. Tables 3-4 list themes, subthemes, example lay-provider quotes, and the number of lay-providers who described each subtheme positively or negatively.

Theme 1: Interpersonal Interactions

This theme captures the interpersonal interactions and relationships that were mentioned by lay-providers in their feedback forms. We identified two sub-themes under this main theme: Getting to know others and Team dynamic. Getting to know others was mentioned exclusively positively twice immediately post-training and three times post-intervention. Team dynamic was mentioned positively in two instances immediately post-training; it was mentioned positively in four instances and negatively in two instances at post-intervention.

Specifically, two lay-providers at immediately post-training and three at post-intervention discussed their appreciation of interactions with the study team and other group leaders. For example, one lay-provider particularly valued the work environment created by spending a lot of time working and talking together as a team. In response to a question about what should be kept the same about training and supervision, one lay-provider said:

“The level of interaction between the study team and the group leaders because it creates a conducive and friendly work environment.”

An additional two lay-providers at immediately post-training and three at post-intervention discussed aspects of the team dynamic that they particularly enjoyed. Most pointed to openness, consideration, and valuing all opinions. In response to a question about what should be kept the same about training and supervision, one lay-provider said:

“There was a rare space where you could say anything, and whatever you said was accommodated and taken into consideration.”

Importantly, opinions on the team dynamic were not universally positive at post-intervention, with two lay-providers discussing the team dynamic in a critical fashion. At times during the intervention delivery, lay-providers raised concerns in supervision, particularly about

payment (e.g., timing of reimbursement for transportation) and about the frequency of time-reminders during sessions. Thus, one lay-provider responded to a question about how we could change training and supervision in future years with: “How you handle your team; equality [treating everyone with equal importance] is important.”

Training Style

This theme encompassed instances in which lay-providers mentioned aspects of the style of training. We identified six sub-themes under this main theme: Clarity, Role-plays, Open discussions, Reviewing protocol (only relevant to supervision), Didactics, and Feedback. Immediately post-training, all comments about training style were positive – lay-providers commented on clarity in two instances, role-plays in five instances, open discussions in five instances, didactics in one instance, and feedback in one instance. Post-intervention, lay-providers mentioned clarity positively in two instances, open discussions in six, feedback in one, and reviewing the protocol in three. One lay-provider also mentioned reviewing the protocol in a negative light. Specifically, they suggested that we should review protocols even more frequently in supervision.

Open discussions appeared to be a particularly important sub-theme, as about half of participants at both timepoints discussed the value of being able to ask questions openly and to make suggestions throughout training and supervision. For instance, when asked about positives of training, one lay-provider said:

“Understanding and clarification of each and every expectation: learning a great deal. ... Asking questions and learning freely.”

Additionally, immediately post-training, many lay-providers said that they particularly appreciated and learned from role-plays, despite them being a bit scary at first for many participants. Similarly, several participants appreciated the active protocol reviews that involved role-playing during supervision meetings. One lay-provider discussed how role-playing helped group leaders prepare for the unexpected in group sessions, saying, “Role playing helped identify issues that would emerge and how to solve them.”

Training Logistics and Timing

This theme captures mentions of logistical and timing-related aspects of training and supervision. We identified five sub-themes under this main theme: Food and transport, Time management, Time of training, Length of training, and Location of training. Immediately post-training, almost all negative/constructive comments were around logistics and timing of training. Lay-providers mentioned food and transport once negatively and once positively, time management three times negatively, length of training twice negatively, and location four times negatively. After the intervention was completed, still, most negative comments were about logistics and timing, with three instances of negative comments about food and transport, six about time-management, and three about length of training.

Participants mentioned concerns about traveling to and from training. For example, several participants suggested that training should be set in a more central location such that participants would not have to travel far to reach training (this may have been particularly cumbersome because of heavy traffic in the Nairobi area).

“Get a venue in a central place, preferably [central location] ([other location, ~1 hour away] is really far.)”

Lay-providers also suggested that the trainers provide them with a “a time-tabled list of events and time-frames,” which may be difficult to do up-front when working with schools, clinics, or other community organizations with uncertain schedules. However, future studies could benefit from trying to provide as detailed and accurate of a timetable as possible early in recruitment and training, as this will allow lay-providers to organize their schedules. Finally, to our surprise, several lay-providers suggested making training longer. We had designed training to be brief (10 hours over two days) in order to reduce the time and transportation burden of training. However, lay-providers suggested that they could have benefitted from more time to learn and ask questions prior to beginning to lead groups:

“Increase the day and training by probably one day. This will set a sufficient time for the people involved not to rush on things.”

Training Content

Quotes categorized under this theme include lay providers’ comments about the skills and concepts taught in training. We identified four sub-themes under this main theme: General skills for group leadership, Peer counseling skills, Validation (a specific peer counseling skill mentioned frequently relative to other peer counseling skills), and Intervention content. General skills for group leadership were discussed positively by six lay-providers immediately post-training and four post-intervention; they were discussed negatively by one lay-provider post-intervention. Most lay-providers discussed the value of learning to stay on protocol and how to manage group dynamics. For example, in response to a question about useful skills learned, one lay-provider cited “how to handle a student question being irrelevant,” and another cited “to stick to the content and not deviate out of the content.”

Additionally, immediately post-training, lay-providers discussed peer-counseling skills in an exclusively positive light, with six discussing peer-counseling skills generally and five discussing validation specifically. Post-intervention, four lay-providers discussed peer-counseling skills other than validation positively (one discussed these negatively) and three discussed validation positively. These lay-providers most often discussed their appreciation of learning how to make others feel validated, how to listen to all students, and how to ask open-ended questions. For instance, one lay-provider said that they learned:

“The importance of validation. It enables one to really listen to people and be able to repeat what they say. Also thanking people for sharing their opinions and feelings.”

Several lay-providers also appreciated the intervention content (e.g., growth mindset, gratitude, value affirmation) they learned in training and supervision. This theme was always mentioned as a positive aspect of training and supervision. For instance, one lay-provider expressed gratitude for learning “That people can really grow; they can change how they think or even act.”

Expressions of Positivity/Personal Growth

This theme encompasses comments from lay-providers that express their growth as a person or their general appreciation for the experience of being a lay-provider. Immediately post-training, eight lay-providers offered these sentiments; after completing the intervention, five lay-providers did the same. For example, one lay-provider commented on training:

“I loved it and I appreciate you guys doing this in our country which will make a difference in the future.”

Another cited personal growth thanks to their involvement in the study:

“I enjoyed the training. It has also improved my personality and skills.”

Discussion

In this study, we described the training and supervision procedures for the Shamiri Wellness Intervention (Osborn, Venturo-Conerly, et al., 2020). Informed by previous research on training and supervision (e.g., Murray et al., 2011; Singla et al., 2017) and our previous experiences in Kenya (Osborn, Wasil, et al., 2019), we designed a very brief, 10-hour training for lay-providers led primarily by undergraduate students. We also assessed lay-providers' perceptions about the training and supervision process. Overall, quantitative and qualitative ratings of training and supervision by lay-providers suggest that the training and supervision procedures were highly acceptable, feasible, and effective. Additionally, independent ratings of intervention fidelity and lay-provider competency were acceptably high, potentially reflecting the effectiveness of training and supervision procedures.

The perspectives of lay-providers highlight specific aspects of our training and supervision procedures that may be especially important. For instance, we found that lay-providers particularly appreciated opportunities to interact with other lay-providers and the study team, learning skills that would improve their own interpersonal and emotional skills even beyond the study (e.g., peer counseling skills such as validation), and having the opportunity to help high school students. These findings suggest that one strategy to improve lay-provider recruitment, engagement, and retention could be emphasizing the interpersonal skills and opportunity to help others that lay-providers will receive. We also found that lay-providers appreciated the openness of group discussions during training and supervision, the ability to ask

questions and offer feedback freely, and the opportunity to perform role-plays. Therefore, it may be important for future trainers to emphasize, as we did, our eagerness to answer questions and receive feedback and to emphasize the importance of role-plays. Importantly, in addition to the fact that role-plays are considered highly effective training procedures (Murray et al., 2011; Verdeli et al., 2003), our findings highlight that they are also appreciated by lay-providers. Finally, we found that weekly reminders of the content of the intervention protocols were extremely helpful during supervisions, as was the opportunity to bring up issues throughout the study. We recommend setting aside time for content reviews and feedback during supervision. The lay-providers also offered constructive criticism to inform future work. For instance, we found that lay-providers would have preferred if training were located more centrally, had ended earlier in the day to allow for easier and safer transportation, if we had provided them with a more detailed schedule of study-related events early in their involvement, and, surprisingly, several mentioned that they would have preferred a longer training period to allow for more time to discuss protocols in detail and ask questions.

As trainers and supervisors, we also noted during training and supervision several particularly important and unexpected findings and challenges. First, during discussions in training, the lay-providers most often mentioned learning basic skills for group leadership, specifically that they should stick to the protocol and that they should allow students to speak more in discussions than they speak themselves. This indicated to us as trainers that a key aspect of training is to consistently emphasize several core skills (e.g., stick to the protocol, ask questions and let participants speak, respect confidentiality, reach out to your supervisor in emergencies) and that trainers should decide together what these core skills should be and work to emphasize them consistently. Second, we found that it was very important to adjust

procedures during supervision upon feedback from lay-providers. For example, during supervision meetings, we were able to address an issue around time-reminders during the group sessions. Specifically, some group leaders preferred very frequent time-reminders, while others felt uncomfortable with them – this issue was raised and resolved during supervision meetings, and we arrived at a compromise through discussion in which everyone received one time-reminder and the lay-providers asked their assigned supervisor for additional time-reminders depending on their preferences. Third, we found it helpful to have at least one member of the study team present nearby the groups (which generally occurred in fields outside) and available to troubleshoot during intervention sessions. Importantly, this allowed the study team to occasionally catch and halt clear deviations from the study protocol. For example, the study team sometimes noticed that a certain group was far behind the others and could find an appropriate time (e.g., when all participants were completing a writing activity) to remind the lay-provider of how much time was left. This helped to ensure that all groups ended approximately on time and did not get in the way of other school and home activities.

Some aspects of our approach are especially important from a scalability perspective. First, this study involved undergraduate students leading the training and supervision of lay-providers. In contrast, most previous studies have involved training and supervision from mental health professionals with decades of experience (Hoeft et al., 2018). If replicated, our findings may suggest that undergraduate students—with appropriate supervision and advising from trained professionals—could be able to effectively lead lay-provider trainings. Second, our training lasted only 10 hours, considerably shorter than many lay-provider trainings (e.g., Singla et al., 2017 calculated an average training duration of 78.82 hours and Petersen et al., 2014 reviewed 29 trainings ranging from five days to a year). This is especially important from a

dissemination perspective: shorter trainings are generally less costly and more likely to attract lay-providers. However, very short trainings do require omissions and may lead to more reliance on supervision. We found that covering essential didactics in training (e.g., confidentiality, emergency protocol, general counseling skills, main intervention ideas), then relying largely on group role-plays, which allow everyone to learn the full program content without having to personally role-play all of it, were effective time-saving strategies. Additionally, providing copies of the protocol for home study and briefly reviewing intervention content each week helped to ensure that lay-providers were prepared for sessions.

Other aspects of our approach are worthy of critical examination. For instance, because we were actively recruiting sites and arranging schedules for the lay-providers around busy and uncertain school schedules, we did not provide them with a full timetable of events at the beginning of training. However, based on our experience, this led to some confusion among lay-providers, and it may have been worthwhile to provide a tentative schedule outright even if it were to change after training. Additionally, we used a highly structured rubric when evaluating potential lay-providers. While this rubric provided standardization and was meant to reduce the impact of subjective biases, our rubric may have been overly complicated for use in certain situations with limited time. Finally, during training, we assigned lay-providers the task of reading the intervention protocol for homework. In order to ensure that lay-providers studied the protocol, we could have designed a more effective and consistent method of accountability (e.g., including an attention check in the protocol such as “if you’re reading this sentence, please text us the following code: 742”). Finally, while we did not wish to fire any of the lay-providers we hired, we do recommend that future researchers train several more lay-providers than necessary in order to fill in for those who are absent or who are not performing well.

Additionally, the findings of this study should be interpreted considering some limitations. First, our data are not sufficient to provide causal conclusions about the effectiveness of specific training or supervision procedures. Relatedly, our study was not equipped to determine how much of the intervention's success could be attributed to the training and supervision of the lay leaders. Rather, these data are intended to highlight features that could be examined in rigorous trials comparing different kinds of training and supervision procedures. Second, our sample size is small, and our findings may not generalize to all possible lay-providers. Finally, our findings are specific to our study in Kenya and may not generalize to other cultures.

Our findings suggest several directions for future research. First, future research should examine the extent to which lay-providers retain content and skills for months or even years after training. Second, rigorous future trials are needed to examine which training and supervision procedures are most effective, for whom they are most effective, and in which contexts. Third, future research on "train-the-trainer" models using lay-providers could be especially valuable (Yarber et al., 2015). If effective, approaches that employ former lay-providers trained by undergraduates to train new lay-providers may be especially cost-effective and culturally appropriate. Finally, future research should compare trainings with differing durations in order to strike the best balance between efficiency, effectiveness, and meeting preferences of lay-providers.

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