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Uncovering Determinants of Perceived Feasibility of TF-CBT through Coincidence Analysis

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Abstract

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A mental health provider's perception of how well an intervention can be carried out in their context (i.e., feasibility) is an important implementation outcome. This study aims to identify determinants of feasibility of trauma-focused cognitive behavioral therapy (TF-CBT) through a case-based causal approach. Data come from an implementation-effectiveness study in which lay counselors (teachers and community health volunteers) implemented a culturally-adapted TF-CBT in western Kenya. We identified combinations of determinants that led to feasibility among teacher- and community health volunteer-counselors through coincidence analysis. Among teacher-counselors, organizational-level factors (implementation climate, implementation leadership) determined moderate and high levels of feasibility. Among community health volunteer-counselors, a strong relationship between a clinical supervisor and the supervisee was the most influential determinant of feasibility. Findings from this paper support the development of implementation strategies for the study context and the methodology presented can guide the assessment of determinants in other contexts.

Feasibility, or the degree to which an intervention can be successfully carried out in a given context, is an important implementation outcome and conceptually, a close determinant of implementation success (Karsh, 2004; Proctor et al., 2011). Whether an evidence-based treatment (EBT) is feasible in a given context can greatly impact whether an EBT is delivered in that setting. As such, EBT feasibility is often considered and prioritized during treatment development and adaptation (e.g., Seitz et al., 2014; Stewart et al., 2020; Tutty et al., 2005). If an EBT is perceived to be effective and appropriate but is not feasible in a certain context, adoption is likely to be low. Feasibility may be particularly important to direct service providers who make the final decision to implement an EBT in their setting (Proctor et al., 2011). In low-resource settings where there may be fewer external implementation supports, decisions to implement an EBT likely rely more heavily on the providers' perception of whether the EBT can be feasibly implemented (Brooke-Sumner et al., 2015; Mendenhall et al., 2014). Thus, understanding what leads a provider to consider an EBT feasible in their context—and specifically in low-resource settings—has the potential to guide both the implementation process and the identification of strategies to bolster implementation success.

Despite the importance of feasibility, no research to our knowledge has identified determinants of feasibility. Identifying determinants of feasibility can guide providers, organizations, and systems at large in the selection of implementation strategies, defined as methods that support the adoption, implementation, and sustainability of interventions (Proctor et al., 2013), that match and harness these determinants and enhance EBT implementation. Recent reviews have called for the exploration and identification of determinants of implementation outcomes, like feasibility, to better guide the implementation of EBTs (e.g., Williams & Beidas, 2019). Williams and Beidas (2019) synthesized determinants of implementation success within

child psychology and psychiatry. In their review, they found the majority of determinants of implementation success reported in the existing literature to fall within two levels: provider- and organizational-levels. Examples of provider-level determinants include knowledge of the EBT, self-efficacy in providing the EBT, and intention to use the EBT. Organizational-level determinants include constructs such as leadership support, organizational climate, and implementation climate. See Figure 1 for a conceptual diagram of possible organizational- and provider-level determinants of feasibility as outlined below.

Provider-level Determinants

Self-efficacy is a provider-level construct that refers to a provider's belief that they are able and capable of providing a certain EBT. Research indicates that self-efficacy in providing an EBT can impact EBT use (Harned et al., 2013; Shapiro et al., 2012), EBT quality (Schiele et al., 2014), EBT efficacy (Rohrbach et al., 1993), and EBT attitudes (Schiele et al., 2014). Given the connection between self-efficacy and implementation success across various contexts, self-efficacy is often targeted throughout the implementation of EBTs (e.g., Cashwell & Dooley, 2001; Greason & Cashwell, 2009; Wheeler & Richards, 2007).

Work-related stressors, including burnout, fatigue, and low satisfaction, are also important determinants of implementation success. These stressors are particularly prevalent among mental health providers and can have negative impacts on physical health and the implementation of EBTs (Delgadillo et al., 2018; Maslach et al., 2001; Yang & Hayes, 2020). Burnout can include increased emotional exhaustion while working, increased feelings of disconnection from one's role, and decreased feelings of accomplishment at work. Yang and Hayes (2020) found that burnout impacts physical and psychological well-being, job satisfaction, client engagement, and clinical outcomes. In addition, burnout can lead to less empathy, poor

therapeutic alliance, poor communication, and decreased attention in the therapy context (Salyers et al., 2015). Therapist fatigue can occur during or after a therapy session and has been shown to impact client outcomes and therapy quality (Chui & Hill, 2020). Satisfaction with one's job, on the other hand, may buffer against negative therapeutic outcomes (Samios et al., 2013). Research in the medical field indicates that job satisfaction is related to a provider's belief in evidence-based practice (Melnyk et al., 2010), which is closely related to implementation success (Eslinger et al., 2020; Jensen-Doss et al., 2009). Although it is clear that work-related stressors are important factors in determining implementation success, it remains unclear how these variables may differentially impact feasibility in different contexts.

EBT knowledge is the understanding that providers have of a certain EBT. Behavior change theories indicate that knowledge impacts the use and adoption of EBTs (Michie et al., 2005; Higa & Chorpita, 2008). Roudbarani et al. (2022) recently found that clinician knowledge of mental health-related topics predicted intentions to use an EBT with children diagnosed with autism spectrum disorder or attention-deficit hyperactivity disorder. Other research highlights that EBT knowledge may not fully predict whether providers employ an EBT (Walrath et al., 2006) or have a positive attitude towards the EBT (Nakamura et al., 2011). The mixed results may be in part due to the differential impact EBT knowledge may have on various implementation outcomes. Thus, exploring how knowledge can impact specific implementation outcomes, such as feasibility, is important.

Another important determinant of successful implementation is a *provider's intention* to use an intervention (Huijg et al., 2015). The theory of planned behavior presents intentions as a predictor of behavior (Ajzen, 1991). The literature supports this connection in that health services-based meta-analyses found provider intentions to be associated with provider behaviors

(Eccles et al., 2006; Godin et al., 2008). Mental health research – albeit limited – found similar connections between provider intentions to utilize an EBT and EBT utilization (Fishman et al., 2018; Williams, 2015b). In addition to EBT utilization and behaviors, a provider’s intention to use an EBT is likely related to whether a provider believes the EBT is feasible in their setting.

Clinical supervision includes the provision of ongoing support by an EBT expert to EBT providers (Bearman et al., 2017) and is commonly used as a post-EBT training strategy to improve EBT implementation (Falender & Shafranske, 2004; Hoge et al., 2011; Schoenwald et al., 2013). Supervision has been shown to decrease turnover (Jovanović et al., 2016), increase self-efficacy (Gibson et al., 2009), and increase fidelity in providing EBTs (Bearman et al., 2017). Supervision may also play a role in increasing providers’ perceptions of feasibility, as the supervisor supports providers in their skill development and ability to address barriers to implementing an EBT in their setting. In addition to the practical skills and strategies providers learn in supervision, the relationship between a supervisor and their supervisee can play an important role in implementation success. A strong supervisory relationship and alliance have been associated with increased self-efficacy (Morrison & Lent, 2018; Park et al., 2019), increased therapeutic alliance (Park et al., 2019), and enhanced clinical care (Patton & Kivlighan Jr, 1997). Whether a provider feels supported and respected by their supervisor may impact whether a provider feels equipped to provide an EBT. Thus, both the skills learned in supervision and the relationship between a supervisor and supervisee may be important determinants of feasibility.

Organizational-level Determinants

Implementation climate is the shared perception that a specific intervention is expected, supported, and rewarded within an organization (Klein et al., 2001; Klein & Sorra, 1996).

Although there is limited research investigating the impact of implementation climate on EBT implementation outcomes (Williams et al., 2018), Williams et al. (2020) examined data from 30 outpatient children's mental health clinics and found that improvements in implementation climate predicted wider EBT utilization. In a separate study, Williams et al. (2022) similarly found that implementation climate predicted increased adherence and competence in providing EBTs. In a cross-sectional analysis, which may be limited in its ability to detect a temporal relationship, Becker-Haimes et al. (2017) failed to find a significant association between implementation climate and EBT utilization within community mental health settings. Given the possible connection between implementation climate and implementation success, exploration of the differential impact of implementation climate on implementation outcomes, and specifically, feasibility is warranted.

Implementation leadership, which is operationalized as leadership behaviors that support the implementation of an EBT (Aarons et al., 2014), is an important determinant of implementation success (Meza et al., 2021). Powell et al. (2017) examined leadership within 19 mental health agencies in Pennsylvania and found that implementation leadership was associated with provider attitudes towards an EBT. Similarly, a study of community mental health clinics in Southern California found a significant relationship between implementation leadership and other implementation constructs (organizational climate, burden, and EBT use; Brimhall et al., 2016). Other studies have connected implementation leadership to provider attitudes towards an EBT (Aarons, 2006), implementation climate (Williams et al., 2020), and organizational culture (Aarons, Ehrhart, Torres, et al., 2017). Implementation leadership may positively impact feasibility as increased leadership support can make it easier for providers to implement an in their organization.

Differential Impact of Determinants

Provider- and organizational-level determinants may have a differential impact on feasibility depending on the context in which an EBT is implemented. For example, in a context with a more diffuse organizational structure, certain provider-level determinants may influence feasibility the most. Alternatively, in a setting with high levels of implementation climate, determinants like self-efficacy may be less important. Powell et al. (2020) recently conducted a systematic review of determinants of implementing a trauma-focused EBT for children. The authors found determinants at various levels that may contribute to implementation success, yet ultimately highlight the need to explore how determinants may work together to influence implementation outcomes (Powell et al., 2020). To address the likely complexity in determinants of feasibility, different analytic approaches are needed to uncover these complex patterns and variation in important determinants across settings.

Current study

The current project aims to identify provider- and organizational-level determinants of feasibility. Given the lack of existing literature on determinants of feasibility, this project is largely exploratory. Building on a hybrid Type II Implementation-Effectiveness trial of a culturally- adapted trauma-focused cognitive behavioral therapy (TF-CBT; Dorsey, Gray, et al., 2020), we utilized a four-phase determinant selection process before our data analysis. First, we explored theoretical models and existing literature that outline implementation determinants that lead to implementation success. Second, we engaged stakeholders with expertise in the implementation of the adapted TF-CBT to guide determinant selection. Third, we applied a practical lens in which we considered whether each determinant could be impacted by certain implementation strategies. Fourth, we conducted a statistical approach to further refine the

determinant selection. Upon completion of determinant selection, we conducted coincidence analysis to identify the causal chain of implementation determinants and feasibility.

Method

Parent Study

Participants

The data from the current study come from an ongoing Hybrid Type II Implementation-Effectiveness trial of a culturally-adapted TF-CBT, Pamoja Tunaweza (PT), delivered by teachers ($n = 125$) in the education sector and community health volunteers ($n = 123$; CHVs) in the community/health sector (Building and Sustaining Interventions for Children (**BASIC**): Task Sharing Mental Health Care in Low Resource Settings; Dorsey, Gray, et al., 2020). Forty public schools of 137 in western Kenya were randomly selected to provide PT and made up the education sector. The 40 communities that surround the schools were also identified to provide PT and made up the community/health sector. Thus, each of the 40 sites has both education and health sector counselors to deliver PT. Each site includes three teacher-counselors and one site leader (Head Teacher) in the education sector and three CHV-counselors and one site leader (Community Health Extension Worker; CHEW) in the health sector for a total of 240 counselors and 80 site leaders across the 40 sites. There was some counselor turnover, so the final sample included 248 counselors; there was also some overlap for CHEWs who may provide oversight to multiple health sector communities. Each site conducted two sequential, 8-week PT groups, one with girls and one with boys, in both the health and education sectors. 849 children received PT upon study completion. Five Kenyan trainers and supervisors support the implementation of PT in the schools and the community. Data for the current study come from the 248 counselors that

provided PT to schools and in the community (see Table 1 for demographic information for CHV- and teacher-counselors).

Procedures

The parent study follows an incomplete stepped wedge cluster randomized design in that sites are randomly assigned to sequences in which counselors receive PT training and provide PT to their site. The incomplete stepped wedge design includes seven sequences with different study start times. At a given point, one cluster of sites will begin PT training and implementation and another cluster of sites acts as the control group. However, the current study does not use data from the control groups. There are a total of seven sequences such that there are seven rounds of training and implementation of PT. Upon completion of the first sequence, the study team designed coaching to help support counselors in the following sequences. The implementation phase ends once the counselors deliver two PT groups (and sites move into the sustainment phase). During the implementation phase, children were randomized to receive PT by CHV or teacher counselors. All PT groups were held in the children's schools. At the time of writing this manuscript, the sustainment phase is still ongoing.

Pamoja Tunaweza

Pamoja Tunaweza (PT; Together We Can in Kiswahili) was designed based on TF-CBT. TF-CBT is an EBT for children who experience psychological distress following a traumatic event (Cohen et al., 2016). The Kenyan team and Tanzanian counselors and supervisors from a pilot study (O'Donnell et al., 2014) and randomized control trial (RCT; Dorsey, Lucid, et al., 2020) adapted TF-CBT to create PT. Some adaptations include leveraging lay providers, conducting the treatment in a group setting, calling the intervention a class, and tailoring terminology and stories to be appropriate in the given context (Woods-Jaeger et al., 2017). PT

originally included 12 group sessions in the pilot and RCT but was shortened for BASIC. The EBT includes 8 group sessions and 2-4 individual sessions. Within each PT group, two counselors conduct the children's sessions, and one counselor conducts the guardians' sessions. Children are eligible to participate in the group if they experienced the death of at least one parent, are between 11 and 14 years of age, and report prolonged grief and/or posttraumatic stress.

Current Study

The current study includes data from a total of 248 counselors (125 teachers and 123 CHVs).

Measures

Measurement Approach. Given the Kenyan context of this study and the high-income country (HIC) origin of many implementation measures, the Kenyan and U.S.-based research teams dedicated substantial time to measurement selection. We prioritized existing measures of implementation constructs that were developed in LMICs (Haroz et al., 2019). However, when those measures were not available, we selected implementation measures developed in HICs and worked with the Kenyan research teams to adapt, translate, and back translate each measure. In adapting measures for the study context, the U.S.-based and Kenyan research teams first discussed the implementation construct definitions (Proctor et al., 2011) and then edited each measure item to be best understood in the study context. When a measure developed in an LMIC or HIC that was appropriate for the study context was not available, we created measures following the Theoretical Domains Framework (TDF; Atkins et al., 2017; Huijg et al., 2014). The TDF outlines different domains and determinants of behavior to help guide the development of behavior-based measures. We calculated the inter-item correlations (IIC) for each measure

included in these analyses and required a minimum of 0.20 for each measure item (Piedmont, 2014).

Outcome.

The Perceived Feasibility Intervention measure captures the counselor's perception of PT's feasibility in their context (Weiner et al., 2017). Weiner et al. (2017) designed this measure to better delineate the core construct of feasibility and to better differentiate it from both appropriateness and acceptability. The measure includes four items (e.g., "Pamoja Tunaweza is easy to use in this community") on a five-point Likert scale from "agree" to "strongly disagree". Higher scores indicate higher levels of feasibility. Weiner et al. (2017) found that the measure had acceptable internal consistency ($\alpha = 0.89$) and test-retest reliability ($r = 0.88$). The measure was initially developed in a HIC, so the Kenyan and U.S.-based research teams adapted, translated, and back-translated the measure to be appropriate in the western Kenyan context. Mean IIC for the perceived feasibility measure was acceptable ($r = 0.51$) for this study. Data for the current study come from the counselors' completion of this measure after the site implemented two PT groups.

Provider-level determinants.

Perceived self-control and self-efficacy measure was created by the study team using the TDF beliefs about the capabilities domain (Huijg et al., 2014) to capture counselors' perceived control and self-efficacy in providing PT in the future. This measure consists of six items with a mix of self-control specific (e.g., "I have control over delivering a Pamoja Tunaweza group in my school") and self-efficacy specific statements (e.g., "I am confident that I can deliver Pamoja Tunaweza") rated on a five-point Likert scale. Some responses are rated from "very difficult" to "very easy" and other responses are rated from "strongly disagree" and "strongly agree". Mean

IICs for self-control and self-efficacy subscales were acceptable ($r = 0.47$, $r = 0.41$ respectively) in this study. Higher scores indicate more perceived self-control and self-efficacy. The measure was completed by the counselor after the training and before the implementation of PT.

Pamoja Tunaweza Knowledge test was used to assess the counselor's knowledge of PT and was based on the TF-CBT knowledge test created for TF-CBT training and certification. The Kenyan and U.S.-based research teams adapted the measure to be appropriate for the Kenyan context and to align with the modifications made to TF-CBT in PT (Dorsey, Lucid, et al., 2020). The PT knowledge test included 19 items with either True/False or multiple-choice responses. Higher scores indicate more PT knowledge. Counselors completed the PT knowledge test immediately after the PT training.

Intentions to use Pamoja Tunaweza measure was developed by the study team to assess counselors' intentions to implement PT in the future. The team based the measure on the TDF domain items (Huijg et al., 2014), Evidence-Based Treatment Intentions Scale (Williams, 2015a), and the John Hopkins University (JHU) Implementation Science scale (Haroz et al., 2019). The final measure included four items (e.g., "I intend to provide Pamoja Tunaweza/ TF-CBT to orphaned children in my community next month") on a four-point Likert scale (1 = not at all, 4 = a lot) and one item on a three-point Likert scale (1 = not at all likely, 3 = very likely). Mean IIC for the intentions scale was acceptable ($r = 0.27$) in this study. Higher scores indicate more intentions to use PT. Counselors completed this measure post-training and before the implementation of PT.

The Professional Quality of Life measure assesses satisfaction, fatigue, and burnout related to providing PT (Stamm, 2010). This measure included 13 items on a five-point Likert scale from "strongly disagree" to "strongly agree" and "never" to "always". We separated the

measure by subscales: satisfaction (five items such as “I am proud of what I can do to help as a Pamoja Tunaweza/TF-CBT counselor”), fatigue (three items such as, “I am not as productive at work because I am losing sleep over traumatic experiences of a child/guardian I counseled in Pamoja Tunaweza/TF-CBT”), and burnout (five items such as, “I am tired of working with Pamoja Tunaweza/TF-CBT children/guardians”). Mean IICs for burnout, fatigue, and satisfaction subscales were acceptable ($r = 0.45$, $r = 0.41$, $r = 0.43$ respectively) in this study. Higher scores indicate more satisfaction, fatigue, and burnout. Counselors completed this measure post-implementation of two PT groups.

Supervisory Relationship was assessed via an adapted version of the Short Supervisory Relationship Questionnaire (Cliffe et al., 2016). This measure includes 14 items and three subscales: safe-base, reflective education, and structure. We included all three subscales in our analysis. The safe-base subscale measures the extent to which counselors found their supervisor to provide a collaborative and safe environment to discuss clinical cases. The reflective education subscale measures to what extent counselors find their supervisor to provide reflective and educational support during supervision. The structure subscale refers to whether the supervisors utilized the prescribed elements of supervision. All rated on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree), the safe-base subscale includes eight items (e.g., “My supervisor was approachable”), the reflective education subscale includes three items (e.g., “My supervisor encouraged me to self-evaluate my delivery of PT”), and the structure subscale included 3 items. Cliffe et al. (2016) found that each subscale had good internal consistency: safe-base $\alpha = 0.97$, reflective education $\alpha = 0.89$, and structure subscale $\alpha = 0.88$. The measure as a whole had strong test-retest reliability ($r = 0.94$). In this study, the subscales had acceptable mean IICs ($r = 0.42$, 0.39 , 0.21). Higher measure scores indicate a stronger perceived

supervisory relationship. Counselors completed this measure after the implementation of two PT groups.

Organizational-level determinants

The Implementation Climate Scale (ICS) assesses implementation climate and includes 10 statements (e.g., “I get the support I need to use Pamoja Tunaweza”) rated on a five-point Likert scale from “strongly disagree” to “strongly agree” (Ehrhart et al., 2014; Jacobs et al., 2014). Fernandez et al. (2018) found the original ICS to have acceptable internal consistency ($\alpha = 0.72$) and to include reliable organizational-level means ($ICC = 0.22$). In the current study, we found that the adapted ICS had an acceptable mean IIC ($r = .39$). Higher scores on the adapted ICS measure indicate a more positive implementation climate. The adapted ICS was completed after the implementation phase of PT by counselors.

Implementation Leadership was assessed using an adapted version of the implementation leadership scale (Aarons et al., 2014) This measure includes 12 items (e.g., “leader is knowledgeable about Pamoja Tunaweza/TF-CBT”) rated on a 5-point Likert scale (0 = not at all, 4 = very great extent). Aarons et al. (2014) found excellent internal consistency (ranging from $\alpha = .95-.98$) and acceptable reliability of organizational-level means ($ICC = 0.29$) for the original measure. Despite the four subscales, we utilized the overall measure in our analyses. The adapted implementation leadership scale in our study had an acceptable mean IIC ($r = .53$). Higher scores on this measure indicate stronger implementation leadership. Counselors completed this measure for their designated leader (Teachers’ leader was their head teacher, CHV’s leader was their community health extension worker; CHEW) post-implementation of two PT groups.

Analytic Method

To examine which implementation factors were associated with the feasibility of PT, we utilized coincidence analysis (CNA), a configurational comparative method (CCM). As opposed to regression-based analytic methods, CNA relies on the regularity theory of causation (i.e., variables can be “difference-makers” such that their presence when certain other variables are present lead to a certain outcome; Whitaker et al., 2020). CNA identifies the minimum set of configurations (i.e., combinations) of conditions (i.e., determinants) that are necessary and sufficient for the presence or absence of a specific outcome (i.e., feasibility; Baumgartner & Thiem, 2015). Necessary conditions must be present for the outcome, while sufficient conditions are ones that alone can lead to the outcome (Gwayi-Chore et al., 2022). CNA can also identify INUS conditions, or those that are Insufficient by themselves yet Necessary when paired with other combinations of conditions that are Unnecessary and Sufficient for the outcome to be present (Gwayi-Chore et al., 2022; Whitaker et al., 2020). CNA and the identification of INUS conditions capture the complex nature of real-world implementation, as one condition alone will rarely lead to the successful implementation of an EBT. Further, CNA enables exploration of causal complexity through conjunctivity (i.e., multiple conditions must be paired to lead to an outcome) and equifinality of conditions (i.e., there are multiple configurations of conditions that lead to a single outcome), which is often the case when interventions are implemented in different contexts (Gwayi-Chore et al., 2022). Although other analytic methods utilize regularity theory and INUS conditions (e.g., Logic Regression, Qualitative Comparative Analysis), CNA is the only method that reliably produces redundancy-free and thus easy-to-understand results (Baumgartner & Falk, 2021; Baumgartner & Thiem, 2015).

The reasons for selecting CNA for this paper are fourfold. First, CNA’s inductive approach can address an exploratory research aim. Second, a case-based approach allows

researchers and implementers to better consider the context in which the data is collected. Given the purpose of this paper is to guide implementation strategy selection in the real world, it is critical to consider the context of the research and iteratively refer back to the cases that inform the results. Third, CNA provides rich information on the differential and complex impact determinants may have on an outcome depending on the setting. We expect that determinants of feasibility and the configuration of those determinants will present differently depending on the implementation context. Lastly, we selected coincidence analysis over other configurational comparative methods because CNA is inherently redundancy-free (Baumgartner & Falk, 2021; Baumgartner & Thiem, 2015) and thus will identify the most parsimonious model. In a low-resource setting, from which the data for this project arise, it is important to find the fewest determinants of feasibility possible given fewer resources to address and improve the determinants.

Analytic Steps

We followed the analytic steps outlined in Baumgartner and Ambühl's (2020) guide for the "cna" function in R (R Team, 2021).

Step 1: Determinant reduction. As described in the introduction, we relied on theory, literature, stakeholder engagement, and an applied framework to initially reduce the number of determinants in our final CNA models. The result of Step 1 was 15 determinants, which we needed to further reduce in Step 3.

Step 2: Calibrate determinant and outcome. The second step of CNA is to calibrate each determinant and the outcome. We utilized multi-value CNA and calibrated each of our determinants and outcome into low, moderate, and high levels (Baumgartner & Ambühl, 2020). We found limited variation in the majority of our conditions and outcomes, such that each

variable was skewed towards the positive valence. See Table 2 for the mean, median, and range for each of the variables we included in our CNA models. Given the limited variation, we sought to create levels that would be practically helpful for counselors, schools, and organizations in reviewing the results of this CNA analysis. The outcome feasibility is the mean of four items on a five-point Likert scale (1 = “completely disagree, 5 = “completely agree”). The mean feasibility score for all respondents was 4.3, which indicates that the majority either agreed or completely agreed with each statement (i.e., reported high feasibility). In distinguishing between low, moderate, and high levels of feasibility, we balanced creating somewhat equally distributed categories and what made practical levels that could guide future implementation efforts. Thus, we decided upon the final levels: low – less than 3.5, moderate – more than or equal to 3.5, and less than 4.5, high – more than or equal to 4.5. Only three individuals reported feasibility in the low category, so we sought to explore moderate and high feasibility separately. This allowed us to better understand whether and under what conditions led to a difference between “good enough” feasibility and “excellent” feasibility. During these decisions, we relied on stakeholder and study team meetings to finalize levels for the outcome and each determinant. We followed an approach similar to that of feasibility for each determinant. Upon calibration completion, we had a total of 45 conditions to include in our models given that each of the 15 determinants had three possible conditions (low, moderate, and high).

Step 3: Further reduce conditions. We sought to reduce our 45 conditions further through the “msc” function in R, which identifies the conditions and configurations that are most related to the outcome to include in the final model (Ambühl et al., 2020). CNA utilizes two main model fit metrics to guide model construction: consistency and coverage. Consistency is how reliable the model is, and coverage is how relevant the model is. Consistency can be

calculated by cases with the outcome present and covered by the model solution over cases covered by the model solution. Coverage can be calculated by cases with the outcome present and covered by the model solution over cases with the outcome present. In running the “msc” function, we set the consistency and coverage scores to a number between 0-1. In a dataset without noise, we would set both consistency and coverage to 1. However, with real-world data, it is often impossible to find results with consistency and coverage set to 1. So, following previous research in configurational comparative methods (Schneider & Wagemann, 2012), we lowered consistency to .75 and coverage to .50. A consistency score of .75 indicates that of all cases that had the identified pathways, 75% had the same outcome. A coverage score of .50 indicates that the pathways identified in this model explain 50% of the cases with a certain outcome.

We ran the “msc” function with each of the four models (i.e., moderate feasibility for CHVs, moderate feasibility for teachers, high feasibility for CHVs, and high feasibility for teachers). The “msc” function guides condition selection by identifying conditions that should be included in the final CNA model and utilizes a separate consistency and coverage threshold than the “cna” function. Following previous research (Yakovchenko et al., 2020) we first set consistency at 1.00 and coverage to 0.25 and lowered consistency by 0.05 until we found configurations that met the consistency and coverage levels. Using this function, we identified conditions that were repeatedly included in solutions that made theoretical and practical sense to the researchers. During this step, we also examined whether missing condition data were identified as important conditions for the final model.

Step 5: Conduct final models

The final CNA models that were run are as follows:

1. Outcome: CHVs that rated PT as *moderately* feasible
 - a. Conditions examined: moderate self-efficacy, low and moderate reflective supervisory relationship, moderate implementation climate
2. Outcome: CHVs that rated PT as *highly* feasible
 - a. Conditions examined: low burnout, low fatigue, high reflective supervisory relationship, high structured supervisory relationship
3. Outcome: Teachers that rated PT as *moderately* feasible
 - a. Conditions examined: moderate self-efficacy, high behavioral intentions, low and moderate reflective supervisory relationship, moderate safe-base supervisory relationship, moderate implementation climate, low and moderate implementation leadership
4. Outcome: Teachers that rated PT as *highly* feasible
 - a. Conditions examined: moderate burnout, high behavioral intentions, high reflective supervisory relationship, high implementation climate, high implementation leadership

Results

Descriptive Statistics

Among CHV counselors, zero reported low levels of feasibility, 53% reported moderate levels of feasibility (i.e., moderate – more than or equal to 3.5, and less than 4.5), and 47% reported high levels of feasibility (i.e., more than or equal to 4.5). There were no missing data for CHV counselors. Among teacher counselors, three reported low levels of feasibility, 62% reported moderate levels of feasibility, and 36% reported high levels of feasibility. We were

missing data from 3% of teacher counselors. However, missing data was determined to be missing at random.

CNA Analysis

In total, we conducted four CNA models: moderate feasibility among CHVs, high feasibility among CHVs, moderate feasibility among teachers, and high feasibility among teachers. We conducted separate condition reductions per model, so we report the results split by model. All results are depicted in tables 3-6. Results are reported using Boolean algebra terms: $X + Y$ indicates disjunction (i.e., “or”), $X*Y$ indicates conjunction (i.e., “and”), $X \rightarrow Y$ indicates implication (i.e., “if...then”), and $X \leftrightarrow Y$ indicates equivalence (e.g., “if and only if”).

CHVs

Moderate feasibility. Among CHVs, our analysis indicated one solution that led to *moderate levels* of feasibility that fit the consistency and coverage levels we set (consistency $\geq .75$, coverage $\geq .50$):

1. $SUPER_REFLECT=2 \leftrightarrow FEAS=2$ (consistency = .75, coverage = .70)

In plain language, this indicates if and only if CHV counselors report moderate levels of the reflective education supervisory relationship subscale (i.e., $SUPER_REFLECT=2$), feasibility will be moderate (i.e., $FEAS=2$).

High feasibility. Among CHVs, we found one solution with two pathways that lead to *high levels* of feasibility that fit the consistency and coverage levels we set (consistency $\geq .75$, coverage $\geq .50$):

1. $BURNOUT=1 + SUPER_REFLECT=3*SUPER_STRUCTURE=1 \leftrightarrow FEAS=3$
(consistency = .77, coverage = .61)

This means if and only if burnout is low (i.e., BURNOUT=1) OR the reflective education supervisory relationship subscale is high AND the structure supervisory relationship subscale is moderate or low (i.e., SUPER_REFLECT=3*SUPER_STRUCTURE=1), feasibility will be high (i.e., FEAS=3) among CHVs.

Teachers

Moderate feasibility. Among teachers, we found one solution with two pathways that lead to moderate levels of feasibility that fit the consistency and coverage levels we set (consistency \geq .75, coverage \geq .50):

1. $ICLIM=2 + SELF_EFFICACY=2*IL_OVERALL_HEAD=2 \leftrightarrow FEAS=2$
(consistency = .77, coverage = .54)

In plain language, this indicates that if and only if the implementation climate is moderate (i.e., $ICLIM=2$), OR self-efficacy is moderate AND implementation leadership is moderate (i.e., $SELF_EFFICACY=2*IL_OVERALL_HEAD=2$), feasibility will be moderately rated among teachers (i.e., $FEAS=2$).

High feasibility. Among teachers, we found four solutions that fit the consistency and coverage levels we set (consistency \geq .75, coverage \geq .50):

1. $ICLIM=3*INTENT=3 \leftrightarrow FEAS=3$ (consistency = .79, coverage = .62)
2. $ICLIM=3* BURNOUT=2 \leftrightarrow FEAS=3$ (consistency = .79, coverage = .52)
3. $ICLIM=3*SUPER_REFLECT=3*IL=3 + ICLIM=3*SUPER_REFLECT=1*IL=1 \leftrightarrow FEAS=3$ (consistency = .81, coverage = .50)
4. $ICLIM=3*INTENT=1*IL =3 + ICLIM =3*SUPER_REFLECT=1*IL=1 + INTENT=3*SUPER_REFLECT=3*IL=3 \leftrightarrow FEAS=3$ (consistency = .81, coverage = .50)

Solution 1 indicates that if and only if the implementation climate is high AND intentions to use PT are high (i.e., $ICLIM=3*INTENT=3$), teacher counselors will rate feasibility as high ($FEAS=3$). *Solution 2* means that the if and only if implementation climate is high AND burnout is moderate (i.e., $ICLIM=3*BURNOUT=2$), teacher counselors will rate feasibility as high ($FEAS=3$). *Solution 3* indicates that if and only if implementation climate is high AND reflective educational supervisory relationship is high AND implementation leadership is high (i.e., $ICLIM=3*SUPER_REFLECT=3*IL=3$) OR implementation climate is high AND reflective educational supervisory relationship is high AND implementation leadership is either low or moderate (i.e., $ICLIM=3*SUPER_REFLECT=3*IL=1$), counselors will rate feasibility high ($FEAS=3$). Lastly, *solution 4* indicates that if and only if implementation climate is high AND intentions to utilize PT is low AND implementation leadership is high (i.e., $ICLIM=3*INTENT=1*IL=3$) OR implementation climate is high AND reflective educational supervisory relationship is either low or moderate AND implementation leadership is either low or moderate (i.e., $ICLIM=3*SUPER_REFLECT=1*IL=1$), OR intentions are high AND reflective educational supervisory relationship is high AND implementation leadership is high (i.e., $INTENT=3*SUPER_REFLECT=3*IL=3$) counselors will rate feasibility high ($FEAS=3$).

Given similar consistency and coverage scores across all four solutions, we followed previous literature to explore model ambiguity (Gwayi-Chore et al., 2022). We found high levels of implementation climate across all four solutions, with high implementation climate (i.e., positive implementation climate) a necessary component of six of the seven possible pathways for high feasibility among teachers (only the third pathway in solution 4 *did not* include high implementation climate).

Discussion

Results from this study suggest that determinants of feasibility differ based on the context in which counselors are embedded. Overall, counselors in this sample relied on some sort of external support either alone or in combination with an internal provider-level construct to guide the perception of feasibility. However, among CHVs who engage in community-based work and are less embedded in an organizational structure, provider-level variables (i.e., burnout and the supervisory relationship) most impacted feasibility. On the other hand, CNA results indicated that among teachers, organizational-level variables (i.e., implementation climate) when paired with other provider- and organizational-level variables were almost always necessary for moderate and high levels of feasibility.

The pathways that rose to importance in our results align with the context of our study and the organizational structure in which lay counselors work. CHVs do the majority of their work outside of the physical health facility to which they are connected. Other than some regular reporting and in-facility time, CHVs spend most of their time traveling within a community to provide health services. Within the context of the BASIC study, the CHV counselors provided PT to children within the schools in their community, to which they were otherwise not connected. In addition, based on conversations with our research partners and counselors in western Kenya, the CHEWs who were CHVs' leaders within the health facilities were less involved in the day-to-day implementation of PT. Thus, CHV's perception of whether they could provide PT in their community likely relied more on their external intervention support such as clinical supervisors rather than internal organizational support. Teachers, on the other hand, provided PT within their roles in a more specified organizational structure and physically provided PT at their own organizations. Teachers reported having stronger leadership support for

the implementation of PT. Thus, we see implementation leadership and implementation climate rising to the top as determinants of feasibility among teachers.

Distilling the different pathways of determinants of feasibility based on the context can guide the selection and tailoring of implementation practices and policies to improve feasibility. Among CHVs, strategies that improve the relationship between counselors and their supervisors may be particularly important. Enlow et al. (2019) present 14 recommendations to clinical supervisors that can improve the supervisory relationship. These recommendations include strategies that impact the differential between a supervisor's style and the supervisee's developmental level, the effect of contextual factors on the supervisee's performance, and the type of supervisor feedback (Enlow et al., 2019). Other scholars have investigated how to fix a ruptured supervisory relationship, which may also be useful in improving perceived feasibility if ruptures occur. For example, Friedlander (2015) describes relational strategies that can be enlisted to increase a supervisee's responsiveness to supervision. Despite the long list of recommendations, it is important to present multiple strategies to counselors and supervisors to tailor the strategies to their context.

Among teachers, it appears important to select strategies to enhance or harness high implementation leadership and climate. Williams et al. (2020) found that improved implementation leadership in an organization indirectly led to improvements in EBP use through an improved implementation climate. Thus, finding strategies that target either implementation leadership or implementation climate may be promising for improving feasibility. Although few formal studies have identified strategies to improve implementation leadership and climate, the Leadership and Organizational Change for Implementation strategy (LOCI; Aarons, Ehrhart, Moullin, et al., 2017; Aarons et al., 2015; Skar et al., 2022) and the Training in Implementation

Practice Leadership (TRIPLE; Proctor et al., 2019) strategy have preliminary supporting evidence and could be considered by organizations. The LOCI strategy included training in an EBT and organizational-level supports for the EBT (Skar et al., 2022). The TRIPLE strategy focused on training leaders to lead and evaluate the implementation of an EBT in an organization (E. Proctor et al., 2019). Despite the identification of some strategies to improve implementation leadership and climate, researchers and stakeholders should examine for whom and for what these strategies work best. Overall, the findings from this study can guide future implementation efforts to improve feasibility within similar contexts and motivate researchers to continue identifying strategies that address the supervisory relationship, implementation climate, and implementation leadership.

The current study exhibits many strengths inherent to the parent study and analytic plan. First, the parent study was built on community collaboration. The intervention was adapted, and initial study questions were developed by the parent study team in Kenya with support from the University of Washington team as needed. All measures included in the current study were adapted, translated, and back-translated to be appropriate in western Kenya. Community participation is critical to the design and implementation of both research studies and therapies in a global context as we cannot begin to assume the needs, values, and challenges of a community for which we do not have lived experience. The participation may also improve the sustainability of PT in western Kenya as the community members who created PT and provided PT can take ownership. Furthermore, the implementation of PT within the parent study provided 849 children who otherwise would likely not receive an EBT. Thus, the large-scale implementation of an effective, culturally sensitive treatment is also a strength of the parent study.

A major strength of this paper is the utilization of CNA to explore the causal chains of implementation determinants of feasibility in different contexts. CNA is a novel approach that is gaining traction within the implementation literature because it can uncover causal complexity – a common occurrence in real-world implementation (Whitaker et al., 2020). CNA allows researchers to better contextualize results within the cases and thus produces more practical results that can be disseminated throughout the context in which the research was conducted. We are currently collaborating with our Kenyan research team to disseminate our findings to counselors and guardians that participated in the research to further contextualize our results. In these conversations with community partners, we hope to generate solutions to improve the feasibility of PT. The first author and U.S.-based principal investigators of this project do not have lived experience in western Kenya or providing PT to children in western Kenya, so it is critical to privilege the voices of those with lived experience in generating these solutions. We urge others to utilize CNA and continuously involve research partners, stakeholders, and community members in the interpretation of the results to bring to light the context and lived experience of study participants.

Despite the major strengths of this paper, there are important limitations. First, although the approach has the potential to strengthen implementation research as a whole, CNA and the reporting of CNA are still developing. In addition, we encountered model ambiguity in the results for teachers who reported high feasibility. Following previous research, we identified conditions that appeared in the majority of solutions to find an important condition. However, other strategies can be used to identify the best model (e.g., exhaustiveness and faithfulness). Further research is needed to develop consistent and universal guidelines for assessing model fit within CNA. Another limitation is in the determinants used in this study. All measures were self-

reported by counselors, yet all interviewers who collected the data from counselors were highly trained. Other important determinants of feasibility may also exist that were not collected as a part of this study (e.g., level of funding within a school). Further work is needed to explore the impact of objective implementation measures on feasibility. Lastly, on average counselors reported high feasibility and thus we were unable to identify determinants of low levels of feasibility. It is important to identify what determines low levels of feasibility in other contexts to better guide the implementation process. Nonetheless, high levels of feasibility indicate that the intervention was doable in the study context, and thus is an important implementation outcome of PT in western Kenya.

Conclusion

Using CNA, we identified organizational- and provider-level determinants of the feasibility of Pamoja Tunaweza as perceived by lay counselors. Among CHV counselors, the supervisory relationship was the most influential determinant of feasibility. Among teacher counselors, organizational-level factors such as implementation climate and implementation leadership determined moderate and high levels of feasibility. Methodology and findings from this paper can guide the assessment of determinants of feasibility and the development of implementation strategies in contexts similar to those in our investigation.

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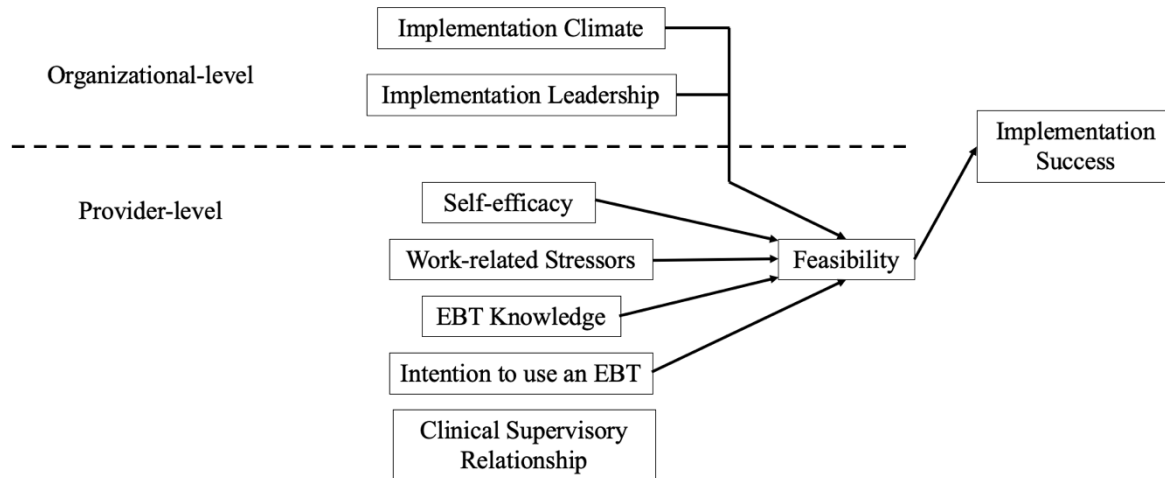
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Figure 1

Organizational-level and Provider-level determinants of Feasibility



Note. This figure is adapted from Williams & Beidas' (2020) *integrated organizational culture-self-determination theory of evidence-based practice implementation* to depict the possible relationship between organizational- and provider-level determinants of feasibility and the relationship between feasibility and successful implementation.

Table 1

Counselor Demographics

| Demographic Variable | CHVs ($n = 123$) | Teachers ($n = 125$) |
|-----------------------|--------------------|------------------------|
| Age [M (SD)] | 43.1 (9.9) | 42.1 (7.6) |
| Female (%) | 70.0% | 62.4% |
| Time at job (year) | 7.2 (4.4) | 7.0 (6.1) |
| Highest Education (%) | | |
| Diploma Certificate | 5.7% | 77.6% |

| | | |
|----------------------------------|-------|-------|
| Primary Education | 24.4% | 0.0% |
| Secondary Education | 69.1% | 4.8% |
| Master's Degree | 0.0% | 17.6% |
| Prior training in MH care (yes) | 52.0% | 48.8% |
| Prior provision of MH care (yes) | 67.5% | 80.0% |

Note. CHVs = community health volunteers, *M* = mean, *SD* = standard deviation, MH = mental health.

Table 2.

Descriptive Statistics

| Variable | Mean (<i>SD</i>) | | |
|-------------------------------------|--------------------|--------------|--------------|
| | Total sample | CHVs | Teachers |
| Outcome | | | |
| Feasibility | 4.33 (0.46) | 4.40 (0.42) | 4.25 (0.49) |
| Determinants | | | |
| Self-control | 4.32 (0.45) | 4.44 (0.42) | 4.19 (0.44) |
| Self-efficacy | 4.08 (0.71) | 4.18 (0.76) | 3.99 (0.65) |
| PT knowledge | 26.61 (3.28) | 25.14 (3.54) | 27.99 (2.28) |
| Intentions to use PT | 3.85 (0.27) | 3.88 (0.23) | 3.81 (0.30) |
| Professional quality of life | | | |
| Satisfaction | 4.59 (0.48) | 4.63 (0.45) | 4.55 (0.52) |
| Fatigue | 1.40 (0.54) | 1.25 (0.46) | 1.56 (0.56) |
| Burnout | 1.53 (0.52) | 1.49 (0.55) | 1.56 (0.48) |
| Supervisory relationship | | | |

| | | | |
|-------------------------------|-------------|-------------|-------------|
| Safe base subscale | 6.59 (0.44) | 6.63 (0.38) | 6.59 (0.49) |
| Reflective education subscale | 6.43 (0.58) | 6.39 (0.63) | 6.47 (0.51) |
| Structure subscale | 4.86 (0.43) | 4.91 (0.45) | 4.81 (0.40) |
| Implementation climate | 4.36 (0.46) | 4.45 (0.41) | 4.26 (0.49) |
| Implementation leadership | 2.82 (0.73) | 3.04 (0.66) | 2.59 (0.73) |

Note. Only the outcome and determinants included in the final CNA models are included in this table. *SD* = standard deviation, CHVs = community health volunteers.

Table 3***CNA Solution for Moderate Feasibility among CHVs***

| Solution | Pathway | Conditions | | | Outcome | Consistency | Coverage |
|----------|---------|---------------|-----------------------------------------------|------------------------|-------------|-------------|----------|
| | | Self-efficacy | Reflective education supervisory relationship | Implementation Climate | Feasibility | | |
| 1 | 1 | -- | Moderate | -- | Moderate | .75 | .70 |

Note. -- indicates that the condition was not significant in the final model.

Table 4***CNA Solution for High Feasibility among CHVs***

| Solution | Pathway | Conditions | | | | Outcome | Consistency | Coverage |
|----------|---------|------------|---------|---------------|-----------------------------------------------|------------------------------------|-------------|----------|
| | | Burnout | Fatigue | Self-efficacy | Reflective education supervisory relationship | Structure supervisory relationship | Feasibility | |
| 1 | 1 | Low | -- | -- | -- | -- | High | .77 |
| 1 | 2 | -- | -- | -- | High | Low/Moderate | High | .77 |

Note. -- indicates that the condition was not significant in the final model.

Table 5***CNA Solution for Moderate Feasibility among Teachers***

| Solution | Pathway | Conditions | | | | | | Outcome | Consistency | Coverage |
|----------|---------|---------------|----------------------|-----------------------------------------------|------------------------------------|------------------------|---------------------------|----------|-------------|----------|
| | | Self-efficacy | Intentions to use PT | Reflective education supervisory relationship | Safe base supervisory relationship | Implementation climate | Implementation leadership | | | |
| 1 | 1 | -- | -- | -- | -- | Moderate | -- | Moderate | .77 | .54 |
| 1 | 2 | Moderate | -- | -- | -- | -- | Moderate | Moderate | .77 | .54 |

Note. -- indicates that the condition was not significant in the final model.

Table 6***CNA Solution for High Feasibility among Teachers***

| Solution | Pathway | Conditions | | | | | Outcome | Consistency | Coverage |
|----------|---------|------------|----------------------|-----------------------------------------------|------------------------|---------------------------|---------|-------------|----------|
| | | Burnout | Intentions to use PT | Reflective education supervisory relationship | Implementation climate | Implementation leadership | | | |
| 1 | 1 | -- | High | -- | High | -- | High | .79 | .62 |
| 2 | 1 | Moderate | -- | -- | High | -- | High | .79 | .52 |

DETERMINANTS OF FEASIBILITY

| | | | | | | | | | |
|---|---|----|----------|--------------|------|--------------|------|-----|-----|
| 3 | 1 | -- | -- | High | High | High | High | .81 | .50 |
| 3 | 2 | -- | -- | Low/Moderate | High | Low/Moderate | High | .81 | .50 |
| 4 | 1 | -- | Moderate | -- | High | High | High | .81 | .50 |
| 4 | 2 | -- | -- | Low/Moderate | High | Low/Moderate | High | .81 | .50 |
| 4 | 3 | -- | High | High | -- | High | High | .81 | .50 |

Note. -- indicates that the condition was not significant in the final model.