Development and Piloting of an Intervention to Reduce Alcohol Use and Improve Family Engagement Among Fathers in Kenya

by

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the Department of
Psychology and Neuroscience in the Graduate School
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ABSTRACT

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Abstract

Problem drinking accounts for 9.6% of disability-adjusted life years worldwide and disproportionally affects men with disabling physical, psychological, and behavioral consequences. These can lead to a cascade of negative effects on men's families, with documented ties to intimate partner violence and child maltreatment. These problems are often exacerbated where poverty rates are high, including low and middle-income countries. To address intersecting risks, we developed an alcohol reduction and family engagement intervention for fathers with problem drinking in Kenya and conducted a pilot study with nine fathers to examine implementation and efficacy outcomes. Study 1 describes intervention development and feasibility and acceptability findings from perspectives of fathers and lay counselors. Study 2 then examines the initial impact of the intervention on alcohol use and related family outcomes using a non-concurrent multiple baseline single case series design. Fathers, their spouses, and one child per family reported on outcomes. Study 1 resulted in a 5-session family focused intervention rooted in behavioral activation, motivational interviewing, and gender transformative strategies modified for context-specific goals and streamlined for lay providers. Results indicated the treatment was feasible and acceptable to fathers as reflected in high attendance, satisfaction, acceptability of implementation strategies, and perceived intervention helpfulness. Lay counselors with

no prior formal training in mental health were able to be recruited and trained, reaching high rates of intervention fidelity, as well as high ratings on quality of implementation and general clinical competency. In Study 2, quantitative and qualitative findings were promising. Fathers who completed treatment (n=8) showed significant reductions in alcohol use based on repeated measures analyses, including fewer number of days drinking and lower amounts of ethanol consumed. Improvements were also seen in pre-post data for other primary outcomes of drinking and family-related problem behavior, father involvement, and time with family from the perspective of multiple reporters. Secondary outcomes also showed improvements on parent-child and couples relationship quality, caregivers' mental health, and caregiver-reported child mental health. Indicators of family violence showed only minimal, non-significant movement in the expected direction. Results suggest that the developed treatment may be helpful for improving men's alcohol use and family outcomes.

Dedication

This work is dedicated to my family, who reminds me to stay grounded, work hard, show gratitude, and laugh. To Sam, I am especially grateful for your continued patience, love, and belief in me; thank you for lifting me up during every point in this process. I really could not have done this without you. To my parents, Rick and Sherrie Giusto, who have supported me in all I do, taught me all I know about people, pushed me to find what I love, and inspired me to go into this field for all the right reasons. Also, to my brother Chris and sister Jenna, for your encouragement, love and humor.

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1. Introduction

Problem drinking is a pervasive global mental health problem that accounts for 9.6% of disability adjusted life years worldwide (Whiteford et al., 2010). Harmful drinking impacts men at high rates with 7.6% of deaths per year attributable to alcohol (Whiteford et al., 2010; Grittner, Kuntsche, Graham, & Bloomfield, 2012) and has negative psychosocial, behavioral, and physical consequences (Rehm et al., 2009; Rehm et al., 2010; Steel et al., 2014). Consumption above moderate levels and risky drinking patterns lead to a number of physical ailments, such as liver cirrhosis, heart failure, and certain cancers (Boffetta & Hashibe, 2006; Laonigro, Correale, Di Biase, & Altomare, 2009; Smyth et al., 2015). Psychologically, these men are at elevated risk for co-morbid mental health issues, including depression, anxiety, and externalizing problems that often exacerbate alcohol-related consequences (Kessler et al., 2011; Grant et al., 2015).

These consequences often extend beyond the individual to impact men's families with clear ties to negative child outcomes and disrupted family systems (Leonard & Eiden, 2007; Freisthler, Merritt, & LaScala, 2006; Wagman et al., 2016). At the child-level, direct associations have been found between male caregivers' problem drinking and youth substance abuse—both onset and patterns; social, emotional and behavioral problems, such as anxiety; and poorer academic functioning (Solis et al. 2012; Atilola et al., 2014; Keller, El-Sheikh, Keiley, & Liao, 2009). Within the caregiver-child subsystem, alcohol abuse influences the likelihood of child maltreatment, harsh parenting, lack of paternal sensitivity and warmth, and decreased cognitive stimulation (Keller et al., 2009; Meinck, Cluver, Boyes, & Mhlongo, 2015). These patterns may be due in part to the impact of drinking on the fathers' mental health, including poor emotion regulation or blunted affect, drinking-related psychosocial stressors, and preoccupation with drug-seeking behavior (Neger & Prinz, 2015). At the couples' relationship level, intimate partner violence (IPV), marital conflict, poor communication, and poor co-parenting are all associated with men's alcohol use in both high and low and middle-income countries (LMICs; Garcia-Moreno & Watts, 2011; Miller et al., 2014; Jewkes et al., 2010).

At the family level, longitudinal pathways have been documented linking paternal drinking to a cascade of poor outcomes. A comparative longitudinal study examining young children with "alcoholic" and "non-alcoholic" fathers showed problem drinking led to marital conflict and aggression which led to harsh parenting outcomes (Finger et al., 2009). Further, research supports another similar pathway through which marital interactions and parenting behaviors mediate the relationship between problem drinking and child adjustment (Goeke et al., 2007; Schacht et al., 2009; Cabrera et al. 2011). A two-year longitudinal study with families from the United States found fathers' problem drinking at baseline predicted marital conflict one year later, which in turn predicted reduced parental warmth and increased psychological control, leading to internalizing and externalizing child problems (Keller et al., 2008).

1.1 Importance of Research in LMICs

The nature, severity, and extent of the negative effects of male alcohol use on the individual and the family are shaped by the context in which they occur. Across LMICs, the most obvious common ecological factor impacting consequences are high rates of poverty that are associated with worsened alcohol use outcomes at the individual and family level (Grittner et al., 2012). For instance, in one multi-country survey, gross national income (GNI) was associated with the amount of external consequences men with problem drinking experienced when compared to men in high-income countries (HIC; Grittner et al., 2012). Additionally, Rhem and colleagues (2009) demonstrated that the global disease burden is closely linked to the average volume of alcohol consumed, and for every unit consumed the burden is greatest for those who are poorer.

Specific cultural factors can also wield a strong influence on multi-level consequences, including norms related to gender inequities and masculinity. Patriarchal norms have been associated with men's increased alcohol use and more severe individual and family-level consequences (Barker, Ricardo, & Nascimento, 2007). For men, such norms can be associated with increased perpetration of violence, poorer mental health, reduced help-seeking behavior, and increased mortality (Garfield, Isacco,

& Rogers, 2008; Wong, Wang, & Miller, 2017). At the family level, interactions between IPV and men's drinking are perpetuated in patriarchal climates, worsening as inequality and hegemonic norms increase (Jewkes, Flood, & Lang, 2015). These can in turn impact children through witnessing IPV (Garrido, Culhane, Petrenko, & Taussig, 2011) and poor or absent parenting practices (Kato-Wallace, Barker, Eads, & Levtov, 2014).

1.2 Existing Evidence-Based Treatments (EBTs)

In LMICs, effective interventions for alcohol abuse exist, including Motivational Interviewing (MI), Counseling for Alcohol Problems (CAPs), and pharmacological treatments (Patel et al., 2007; Nadkarni et al. 2017). Likewise, interventions exist to address problems related to dysfunctional family systems, including those specifically targeting couples and parent-child relationships; these have a strong evidence base in HICs and a growing evidence base in LMICs (Knerr et al., 2013; Mejia Calam, & Sanders, 2012; Darbes et al., 2014; Betancourt et al., 2014; Puffer et al., 2017).

In HICs, there are also treatments addressing both family-level relationship needs and drinking, including Alcoholic Behavioral Couples Therapy (ABCT), which targets the intersection of alcohol-use and couple-level conflict (Powers, Vedel, & Emmelkamp, 2008). A meta-analysis of 12 ABCT trials demonstrated its efficacy for reducing alcohol consumption (d=0.45) and improving marital satisfaction (d=0.51) when compared with control conditions and individual cognitive behavioral therapy (CBT;

Powers et al., 2008). Additionally, some alcohol-focused interventions in HICs have begun to integrate behavioral parenting skills (Lam, Fals-Stewart, & Kelly, 2009) and restorative parenting (Stover, 2015) strategies to mitigate harmful caregiving practices often associated with parental alcohol-abuse (Calhoun et al., 2015; Neger & Prinz, 2015). These treatments have shown reductions in alcohol use, improved parenting, and improved child adjustment (Dawe & Harnett, 2008). Beyond interventions developed in HICs, a systematic review demonstrated interventions addressing the intersection of risk between male caregiver drinking and family-related consequences are essentially non-existent in LMICs (Giusto & Puffer, 2018). Although evidence is more robust in HICs, these treatment models often require long periods of time and typically target individuals in residential or mandated treatment. Despite the potential of these existing EBTs targeting alcohol and family outcomes together, they have not been evaluated in LMICs with the exception of one trial informed by ABCT for alcohol dependent men in India receiving inpatient treatment (Nattalla et al. 2011).

1.3 LMIC Intervention Considerations: Low-Resource Setting Implementation

When extending an intervention to a new setting, steps need to be taken to ensure intervention content accounts for cultural values and norms, salient cultural and contextually perceived drivers of an issue, and language differences. The process of cultural adaptation—modifying interventions to address issues in contextually-relevant and meaningful ways to increase treatment viability – is a response to such concerns. Adaptations can range from surface level modifications to deep adaptation with the ultimate goal of increasing treatment effectiveness (Bernal, Jiménez-Chafey, & Domenec-Rodríguez, 2009; Barrera, Castro, Strycker, & Toobert, 2013). According to the framework proposed by Bernal (1995), adaptations can fall across the following domains: language, persons, metaphors, content, concepts, goals, methods, and context. Though there is debate in the field regarding the necessary level of adaptation, there is support for the position that some level of adaptation beyond translation is associated with more positive outcomes (Barrera et al., 2013).

In addition to identifying approaches that are amenable to adaptation, steps need to be taken that are conducive to scalability in LMICs. Efforts to address barriers to service access in low-resources settings must consider the paucity of trained mental health professionals, as well as the cost, length, and complexity of treatment. Task sharing—training non-professionals to provide treatment—and streamlining evidence-based practices have been solutions to these problems that have gained empirical support (Joshi et al., 2014). Task sharing has proven effective for a range of disorders and treatments across diverse settings, including interpersonal therapy for depression in Uganda (Bolton et al. 2003) and brief treatment for severe depression in India (Patel et al. 2017). It has also proven effective for treating harmful drinking in a primary care setting in India (Nadkarni et al. 2017) and substance use in a hospital setting in South Africa (Sorsdahal et al. 2015). These successes suggest the acceptability, feasibility, and efficacy of task sharing as an approach for treating alcohol use in low-resourced settings, and its likely applicability to treating alcohol use and family-related problems together.

1.4 Overall Research Aims

The purpose of the current study was to develop and pilot a brief intervention to reduce alcohol use and improve family engagement among fathers with problem drinking in Kenya. To accomplish these goals, two studies were undertaken. The first, Study 1, focused on the development of the intervention and its implementation strategy. Study 2 then focused on measuring the initial impact of the intervention on primary outcomes of alcohol use and drinking-related problem behaviors affecting the family and on exploratory outcomes of mental health and family functioning. Each study included specific corresponding aims.

1.4.1 Study 1 Specific Aims

In Study 1, we aimed to: (a) develop a brief alcohol reduction and family engagement intervention for fathers with problem drinking, including content and implementation strategies, and (b) evaluate the feasibility and acceptability of the intervention and its implementation in a pilot study.

1.4.2 Study 2 Specific Aims

In Study 2, we aimed to examine the initial impact of the brief intervention on fathers' alcohol use and drinking-related problems affecting the family. A non-concurrent multiple baseline single case series design was used, including self-, partner-, and child-reported outcomes. Alcohol use changes were examined in depth as the most proximal outcome, as we hypothesized alcohol reduction would likely be necessary for improvements in drinking-related family problems. We further aimed to explore secondary outcomes of family member's individual mental health; overall family functioning, including couple and father-child relationship quality; family violence; and indicators of treatment motivation. The study's overall goal was to provide a preliminary evaluation of the treatment's efficacy to assess viability for a larger trial.

2. Study 1: Intervention Development, Acceptability, and Feasibility

2.1 Methods

2.1.1 Setting

All studies were conducted in the Rift Valley Province of Kenya in a peri-urban community surrounding the town of Eldoret in collaboration with Moi Teaching and Referral Hospital (MTRH). MTRH provides some psychiatric services, including inpatient and limited outpatient care. MTRH is also a part of AMPATH, which consists of MTRH and a consortium of North American Schools in partnership with the Kenyan Ministry of Health. This consortium administers clinic- and community-based programs in the area. All study procedures were approved by the Institutional Research and Ethics Committee at Moi University and the Institutional Review Board at Duke University.

2.1.2 Intervention Development Approach

To develop the intervention, we used a mixed methods, multi-step process. The first goal was to identify existing evidence-based treatments (EBTs) that target alcohol and family outcomes and that were most likely to be feasible and acceptable in the Kenyan context. To this end, we began by analyzing qualitative data collected by our research team examining family interaction patterns associated with positive and negative family functioning and child mental health outcomes. Qualitative results were based on focus group discussions with caregivers and youth, as well as with individuals who were providing mental health services in the area. For this study, we examined the findings related to fathers' impact on the family system and child mental health, as well as pathways specific to male caregiver alcohol use to clarify and contextualize intervention targets. Next, we conducted a systematic review of interventions targeting both alcohol and family-related factors in LMICs (Giusto & Puffer, 2018), as well as a review of other evidence-based strategies targeting these outcomes globally. The resulting literature was evaluated alongside qualitative results to assess the fit of the various intervention strategies with local needs, context, and task sharing potential to identify optimal evidence-based strategies. We then developed a theory of change, and wrote an initial manual streamlined for lay provider use.

Using the initial draft of the manual, we then engaged in a process of collaborative development with a local team. The local team consisted of our Kenyan co-investigator, clinical supervisors, individuals with mental health backgrounds, and lay counselors delivering the intervention. The process allowed for changes to occur, within, and at the end of any stage in order to optimize therapeutic strategies and their cultural relevance. First, a Kenyan clinical psychologist from Moi University and a US-based clinical psychologist reviewed the manual. Second, four individuals with an undergraduate degree in medical psychology from Moi University reviewed the manual, taking structured notes on feasibility, acceptability, understandability, and cultural relevance. Third, intervention concepts were presented during a clinical supervisor training that included nine individuals with previous counseling experience. Fourth, each session was role-played fully with two individuals with mental health backgrounds to examine content flow and simplicity, as well as the conceptual meaning of the used language. Fifth, the manual and intervention concepts were presented, read, and role played with lay counselor trainees to assess conceptual understanding, manual and material-use, and needed level of manual scaffolding (i.e., scripts). Lastly, the intervention was tested with the first two fathers in the pilot study; process data from session transcripts and counselor supervisor meetings were examined throughout cases with the goal of assessing initial understandability, feasibility, and acceptability to inform final adaptations.

The implementation strategies and training materials were developed alongside the intervention. Key decisions included identifying the delivery location, characteristics of counselors and supervisors, methodologies for recruiting counselors, and strategies for recruiting participants. Decisions on these procedures were made collaboratively with the Kenyan co-investigator and local team.

2.1.3 Pilot Study

For the pilot study, we implemented the intervention with nine fathers, including the first two cases completed during intervention development. Participant eligibility was based on the following: a score between 8-20 on the alcohol use disorder identification test (AUDIT; Barbor et al, 2001); a child between the ages of 8 and 17 years; and a female partner or co-caregiver willing to participate in assessment. We used mixed methods to evaluate implementation and clinical outcomes, including reports from the fathers, female caregivers, and children. In this Study we describe the sample and findings related to feasibility and acceptability. In Study 2, we present quantitative and qualitative findings on clinical changes at the individual and family levels.

2.1.4 Measures

2.1.4.1 Recruitment and Participation Tracking

All steps of the counselor recruitment process and family recruitment process were tracked throughout. This included numbers enrolled, attrition, reasons for non-participation, and referral sources. During implementation, we then tracked session frequency, session attendance, and overall treatment length. During recruitment, the AUDIT was used to assess male caregiver eligibility. Responses were sum scored with higher scores indicating more problematic drinking (α=0.89).

2.1.4.2 Fidelity to Intervention Content

Fidelity to the intervention was assessed using standardized checklists developed for this intervention. These were completed using session recordings and verbatim session transcripts. Checklists assessed completion of the intervention steps (yes/no) and the quality of step completion. Ratings ranged from poor (1) to excellent (4). This yielded two scores: (1) percentage of steps completed and (2) mean quality scores across steps. We calculated overall percent completion and quality for each case and examined the data for each counselor and session separately. A Kenyan rater with a bachelor's degree in medical psychology and experience with fidelity monitoring was trained to complete checklists. The first four rated sessions were checked by the lead researcher using session transcripts with the rater reaching over 90% accuracy on each.

2.1.4.3 Clinical Competency

General clinical competency. Counselor clinical competency was assessed from verbatim transcripts and session audio recordings. Counselors' use of general clinical skills (e.g. verbal communication; feelings exploration) was measured using eight items from a the ENhancing Common Therapeutic Factors (ENACT) scale developed for evaluating lay provider-delivered treatment in low-resource settings (Kohrt et al., 2015). These were rated on an adapted scale of 1 to 4, with 1 corresponding to the counselor "minimally meeting patient needs" and 4 corresponding to the counselor "optimally meeting needs." A trained Kenyan individual who had experience using ENACT completed ratings. Consensus ratings with the lead researcher were completed for two sessions to ensure agreement. Average scores were calculated by session and counselor.

Motivational interviewing-specific clinical competency. We also assessed counselors' use of clinical skills specifically relevant to Motivational Interviewing (MI). The global scores of the Motivational Interviewing Treatment Integrity (MITI) Coding Manual 4.2.1 were used to evaluate the overall impression of counselors use of four core dimensions of MI per session: Cultivating Change Talk, Softening Sustain Talk, Partnership, and Empathy (Moyers, Manuel, & Ernst, 2014). Given the global nature of these codes, no adaptations were needed. Dimensions were rated on a five-point Likert scale with a minimum of "1" and a maximum of "5," with higher scores indicating better skill use. The coder begins scoring at a default rating of "3". Scores were averaged across the 4-dimensions. An average score was calculated per counselor and across sessions. Sessions were rated by the trained coder who completed ENACT ratings. Consensus ratings were completed for two sessions prior to independent rating.

2.1.4.4 Training Performance Evaluation

During training, trainee performance was assessed systematically to aid in the final selection of lay counselors from the group of trainees.

Role play-based clinical skill assessment. Trainees completed an assessment of clinical skills pre and post training. The evaluation consisted of a 5-minute role play using a standardized case vignette. Participants' skills were rated with the ENACT scale and the MITI global codes described above. For training evaluation purposes, all domains, including MITI scores, were rated by one of the trainers on the 4-point ENACT scale. Role plays also were audio recorded for group discussion and feedback. Pre and post training ENACT scores and MITI scores were averaged by counselor.

Structured training performance notes. At the end of each training day, facilitators rated selected ENACT and MI domains, as described above, based on trainees' overall performance that day. Facilitators also rated each trainee's openness to feedback, ability to apply feedback, use of the manual, and overall understanding of material. Alongside ratings, structured notes were recorded describing trainee strengths, areas for improvement, and other observations. Ratings and notes were used for tracking progress and for tailoring feedback. They were pooled for each participant across all training days to inform final selection.

Written test. At the end of training, each counselor also completed an applied test using clinical vignettes. The test included tasks such as recalling treatment components the counselor would apply with a client. Percentage correct was calculated.

2.1.4.5 Acceptability and Feasibility: Qualitative Interviews

Semi-structured interviews were conducted to gather perspectives from the counselors chosen for the pilot study and participating fathers. Counselors reported on their satisfaction and opinions of the intervention content, as well as on barriers and facilitators to implementation. Participants were asked about acceptability of intervention content, perceived helpfulness, and acceptability of their counselor. All interviews were conducted individually in Kiswahili by a trained research assistant. Interviews were audio-recorded and transcribed verbatim into English.

2.1.5 Analysis

Descriptive statistics were generated for all data on recruitment, participation, training, fidelity, and clinical competency. Quantitative analyses were conducted using excel and R Statistical Software (Team RC, 2013). Qualitative interviews with families were analyzed using thematic content analysis (Braun & Clark, 2006). Two team members identified themes through close readings of transcripts, which were operationalized into a codebook. Two coders coded the transcripts independently, double coding and reaching consensus on initial transcripts; after reaching 80% agreement, transcripts were divided between the two coders. Following coding, thematic summaries were written for each code to synthesize main themes. For qualitative interviews with counselors, thematic summaries were developed directly from the semi-structured interview guide and transcripts.

2.2 Results

2.2.1. Identifying Context-specific Needs

Our previous qualitative research results elucidated specific interaction patterns related to male alcohol use and paternal disengagement within the family. Two central themes included the importance of gender-specific role fulfillment with the father as provider and the pervasive burden of economic strain on family interactions. For fathers, this often led to an expectation to provide for all family members, but an inability to do so. The inability to fulfill this role was tied to feelings of purposelessness, disrespect in the family, idle time, and couples' quarrels. Drinking was often cited as a means to deal with difficult feelings, feel relief, and have fun with friends. From the perspective of the family, male caregiver drinking seemed to drive family conflict, with the father more likely to quarrel with family members, act violently, not come home, or spend family money on alcohol. Consequences of these behaviors included a lack of basic needs and, at times, the spouse and child temporarily leaving home. Families with fathers who used alcohol were further seen as families who were not united, tending to "go their own way." Overall, data showed clear cycles of conflict, family difficulties, and negative affect that perpetuated drinking. Results indicated the need to target these patterns, to reduce negative feelings, and to build fathers' self-efficacy and unity within the family.

2.2.2 Identifying evidence-based strategies

Through our systematic review, we identified three candidate approaches that matched context-specific needs: (1) Motivational Interviewing (MI); (2) Behavioral Activation for Substance Use (BA); and (3) Gender Transformative Strategies (GTS). MI and BA were identified as optimal central mechanistic components from which to build a contextually feasible and culturally-congruent intervention suited for men with the potential to scale. MI functions to increase intrinsic motivation to change and increase ambivalence about a potentially problematic behavior, such as drinking (Lundahl et al., 2013; Rollnick, & Miller, 1995). BA then aims to increase client engagement in activities that are aligned with the client's values to increase positive reinforcement for behaviors inconsistent with drinking (i.e., break and replace drinking cycles; Kanter, et al. 2010). Lastly, GTS are discussion-focused strategies used for expanding traditional conceptions of masculinity to include care and nurturance, as well as for exploring fathers' ideas about of family relationships (Promundo, CulturaSalud, & REDMAS, 2013).

MI has demonstrated efficacy reducing problem drinking among men in HICs and LMICs (Patel et al., 2007; mhGAP, 2017). It is client-centered and therefore conducive to adaptation; as change is predicated in part on the clients' self-identification of values, and behaviors fit within those values, content naturally follows the client's own beliefs grounded in their culture and context. MI also lends itself to leveraging the caregivers' roles within the family, holding the potential to increase paternal readiness to change drinking and increase family-directed behaviors simultaneously. Yet, MI may require a supplement in order to impact desired behaviors beyond drinking. Indeed, in a separate South African study, MI as a standalone treatment showed reductions in alcohol use, but no impact on family-related outcomes (Kalichman et al. 2009).

Therefore, for targeting multiple outcomes, we chose to integrate BA given its efficacy reducing multiple problems, such as alcohol use and depression (Daughters et al., 2008). It is an ideal candidate for the context given its parsimonious approach (Lejuez, et al., 2011) and widespread effectiveness across populations, contexts, co-morbidities, and varied providers (Strachan et al., 2012; Magidson et al., 2014; Collado et al., 2014). Further, it allows the targeting of emotions such as hopelessness or purposelessness. BA also has an anchor in personal values similar to MI that are amenable to adaptation. With BA, family focused activities, that are guided by identified family values, can be increased and serve the purpose of both increasing family engagement and reducing drinking through new behavioral patterns. Lastly, GTS was selected given its promise for reducing gender-based violence in LMICs, it's potential to help broaden and clarify father's family-based values, and build motivation for family-directed behaviors (Dworkin, Fleming, & Colvin, 2015).

Through the search we also identified three existing interventions using similar treatment models to guide our manualization process. For MI, these were the mhGAP and the screening, brief intervention and referral to treatment (SBIRT) guidelines (mhGAP, 2017; Babor, Del Boca, & Bray, 2017). For BA, this was Life Enhancement

Treatment for Substance Use (LET's ACT!; Daughters et al., 2016). For GTS, this was Program P – a Manual for Engaging Men in Fatherhood, Caregiving, Maternal and Child Health (Promundo, CulturaSalud, & REDMAS, 2013).

2.2.3 Intervention Theory of Change

Strategies from the above approaches were integrated and streamlined into a manualized intervention for lay provider use. Figure 1 presents the intervention's hypothesized theory of change for impacting alcohol use and family-directed behaviors. Intervention elements and specific strategies are depicted in blue boxes on the left-hand side. White boxes represent potential mechanisms of change; green boxes correspond to desired primary outcomes; and the gray box consists of more distal secondary outcomes.

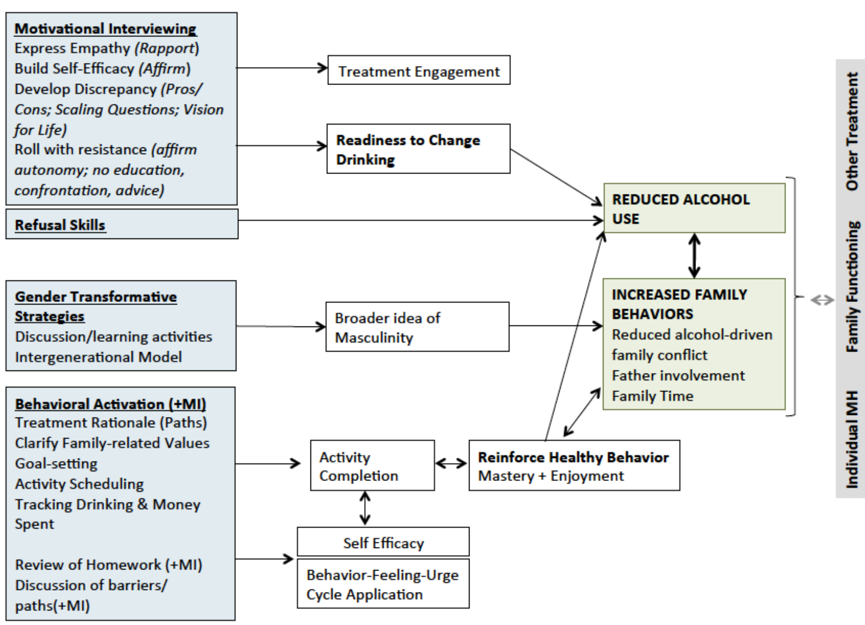


Figure 1: Intervention Theory of Change.

An MI component is first introduced with two goals. The primary goal is to build readiness to change, which has been shown to drive reductions in drinking behaviors in order to reduce alcohol use (Myers et al., 2016). The second goal is to build participant motivation to engage in treatment, given that alcohol-using men and fathers are often difficult populations to engage in interventions (Miller, Meyers, & Tonigan, 1999; Panter-Brick et al., 2014), and MI has been used effectively for engagement and retention (Romano & Peters, 2015). Further, counselors are trained to use MI-informed principles such as empathy, partnership, and respect to guide all therapeutic interactions and delivery. The goal of such a stance is to enhance the therapeutic relationship, create an optimal conduit for delivering treatment, and increase treatment engagement.

BA is then a major focus, with MI integrated throughout, to target outcomes. Fathers identify their values—one related to themselves as an individual and one related to their family. They then identify non-drinking activities that are consistent with these, which are scheduled to be completed outside of counseling. The completion of both self and family focused activities is predicted to impact changes in alcohol use and family-directed behavior through positive reinforcement, including experiences of mastery. Aspects of MI are integrated to enhance client motivation to complete activities and homework outside of session, as well as to build self-efficacy. For instance, when reviewing homework, counselors reflect successes and summarize helpful reduction strategies to highlight patient's ability to be successful.

Also within BA, tracking is conducted. In this case, drinking and the amount spent on alcohol are monitored and reviewed each week to encourage behavior change. Additionally, the rationale for treatment is explained to participants to build insight related to the connections between emotions, urges to drink, consequences of drinking, and engagement in new replacement behaviors. This framework guides homework review and discussions of drinking to build participants' problem solving skills. Lastly, refusal skills are included in order to directly improve a client's ability to reduce alcohol use. The inclusion of activity monitoring, psychoeducation, and a skills-based component are common BA elements for facilitating change (Kanter et al., 2010).

Aspects of GTS are then added to expand conceptions of masculinity (beyond role of "provider"), thereby increasing motivation to engage in family-directed behaviors. They were also intended to increase the saliency of the importance, and potential respect to be gained, by occupying these roles.

2.2.4 Intervention Structure and Specific Content

The intervention consisted of five 60-90 minute long sessions. The schedule for each session is presented in Table 1, and session activities are described below.

Table 1: Intervention Schedule.

	Intervention Schedule
Session 1	Pros and Cons of Drinking: Self & Family Importance Scaling Question Readiness Scaling Question Confirm Commitment Program Vision for Self Vision for Family Value Selection: Self & Family (Value Cards) Program Invitation Path Introduction & Discussion (Treatment Rationale) Homework: Track Drinking. Notice Positive Non-drinking Activities.
Session 2	Drinking and Mental Health Assessment Homework and Path Review: Drinking Event and Resisted Drinking Event Client's Relationship with Father: Positive & Negative Client's Parents' Relationship: Positive & Negative Conceptions of Masculinity: Helpful & Hurtful Value Selection: Self & Family Activity Scheduling Homework: Complete activities. Track drinking.
Session 3	Drinking and Mental Health Assessment Homework and Path Review: Drinking Event and Resisted Drinking Event Refusal Skills Value Selection: Self & Family Activity Scheduling Homework: Complete activities. Track drinking.
Session 4	Drinking and Mental Health Assessment Homework and Path Review: Drinking Event and Resisted Drinking Event Refusal Skills Value Selection: Self & Family Activity Scheduling Homework: Complete activities. Track drinking.
Session 5	Drinking and Mental Health Assessment Homework and Path Review: Drinking Event and Resisted Drinking Event Value Selection: Self & Family (Client-directed) Activity Scheduling (Client-directed) Staying on the Path: People and Strategies to Continue Change Lessons Learned: Treatment Review Graduate

The first session consists of MI-informed strategies, initial identification of values, and discussion of the treatment rationale. After a brief introduction, the counselor prompts the participant to relay what they, and then what their family, like and dislike about their drinking. The counselor summarizes these and highlights the negative consequences. Next, importance of, and readiness to, change drinking are assessed on a 10-point scale ranging from Not at All to Very Ready. After the readiness question, the client is asked why is he not a lower number to generate change talk. If readiness is below a three, this indicates that the participant may not be prepared to engage in treatment. As such, the counselor then leads the client to talk about bad results of their drinking, show care, ask if they want information about the consequences of drinking, and offer support and follow-up. These steps loosely follow those prescribed in SBIRT (2012). When readiness is above a 3, the father is asked if he is ready to commit to the intervention. If the client does not, the counselor asks if he would like to discontinue. If the participant affirms, they continue.

The session then shifts to a focus on identifying family-related values. The father is asked to share his vision for himself and his family using value cards—visual depictions of common values (Figure 2). He is then asked how drinking fits with his vision. After values are identified, the counselor uses the metaphor of a compass to explain how values can help guide the direction of life and treatment, which leads into a discussion of the treatment rationale using the paths depicted in Figure 3. Here, the link between feelings, urges (i.e., "push to drink"), and behaviors on the red arrow path (on the right) are emphasized with a focus on where to "leave the path" (forked arrow) and begin to engage in new non-drinking behaviors and activities to reach values. This new positive sequence of behaviors and consequences is then depicted in the green arrow path on the left. Each path node is discussed using an example story to scaffold questions about the client's experiences. At the end of Session 1, participants are asked to monitor pleasant non-drinking activities and drinking patterns. The client is also given a notebook with activity calendars and a picture of the path.

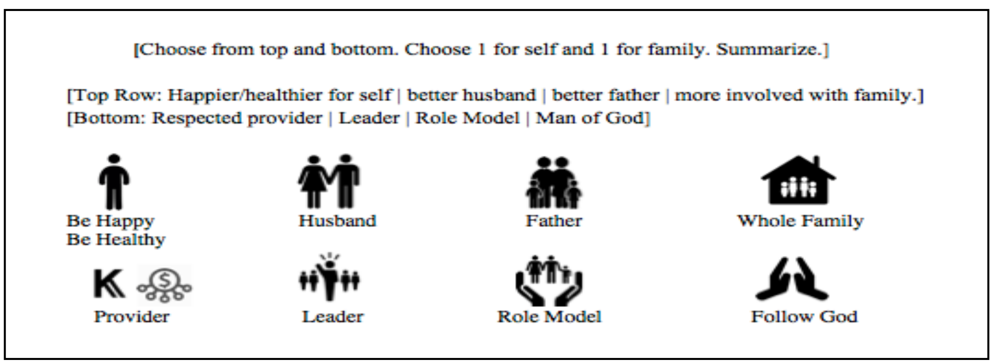
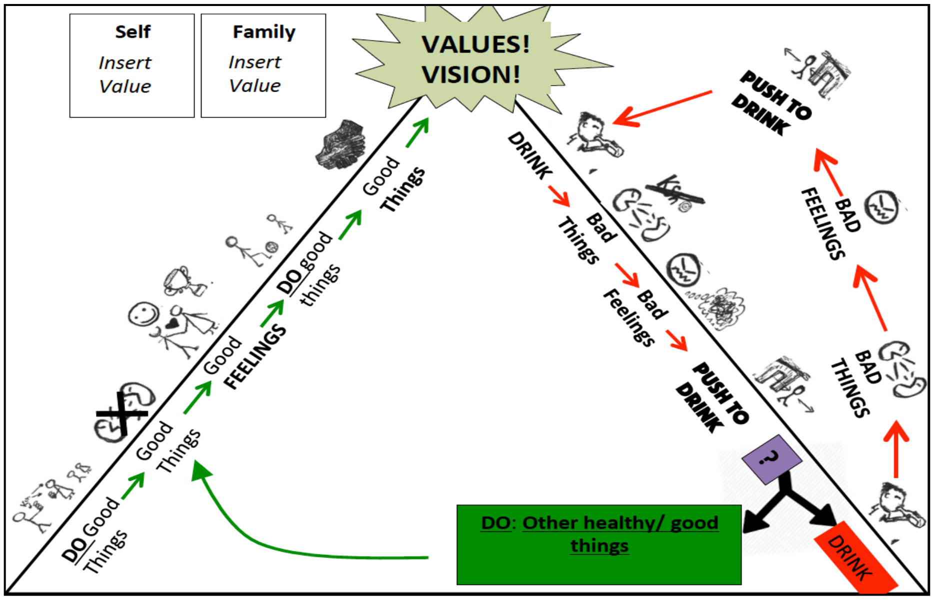


Figure 2: Value Cards



Notes. The counselor works sequentially from "bad things" on the "drinking" pathway on the right with the red arrows. The counselor relays an example of a man going through this path. At each point, he prompts the client to guess what will happen next and then asks the client about their experiences. They then discuss where to break the cycle (green box) to walk a new healthy path (green arrows; pathway on the left) toward their vision.

Figure 3: Drinking and Healthy Paths: Treatment Rationale

All subsequent sessions (2-5) share the same basic schedule, with some unique elements. The first step of each session is a brief assessment of mental health and drinking. Second, the counselor assesses the participant's readiness and confidence in change using the scaling question. At each session, if the client readiness is below a 3, the same procedure described above is implemented. If client readiness is above a 3, the counselor again asks why the participant is not a lower number than what he indicated. Third, homework is reviewed using MI techniques to affirm successes, build self-efficacy, and identify client's existing strengths. The counselor and participant then discuss a time the participant drank and a time they resisted drinking using the paths.

Using structured prompts, the counselor summarizes drinking triggers, positive behaviors, and affirms successes. Fourth, values for self and for family are discussed, chosen, and circled on the activities calendar. Fifth, value-driven activities are brainstormed. Sixth, activities are collaboratively chosen, scheduled on the calendar, and potential barriers to completion are discussed and problem solved. Lastly, homework is given to complete scheduled activities, monitor how they felt, and track drinking.

Gender transformative strategies (GTS) are used in session 2. After assessment is completed, they are asked to think of an object, smell, or feeling that connects them with their father and share that memory. They then discuss the father's models of parenting and relationships through a series of semi-structured questions. Questions prompt the client to identify things they liked and did not like about those relationships, and what they would like to "take" or "leave" from those models to enact in their relationships. Next, they discuss what it means to be a man, and in what ways those ideas may help or hurt. The counselor then summarizes responses to help identify values.

For sessions 3 and 4, unique aspects include the teaching of refusal skills. Skills are introduced during the homework review as a tool for resisting drinking. Prior to their presentation, clients are first asked if they would like to hear about the skills, as asking permission is consistent with MI principles. Next, the skills are reviewed together. Some counselors role played these skills in session, but this was not a required step of treatment. This element was added based on the experiences of the two pilot cases, in which peers were cited as the most difficult barrier to reducing use.

Session 5 then includes a collaborative discussion of lessons learned and identification of others in their family or community to whom fathers would like to relay program lessons to in order to sustain change. The father also identifies a person who can help keep them on their "healthy path." Additionally, a list of community referrals is provided. Lastly, the counselor reviews client progress with a focus on identifying specific areas of growth and presents the father with a certificate of program completion.

A four-session treatment was originally proposed, but a fifth session was added based on counselor and supervisor feedback after the first two pilot cases. Counselors indicated four sessions did not give enough time for participants to internalize and practice lessons; as such, an extra session that mirrored Session 3 was added.

2.2.5 Implementation Approach

Implementation was designed to be an alternative approach to primary care setting models for providing alcohol use counseling. To this end, we collaborated with community leaders identified through existing church partnerships to recruit potential counselors. We searched for men who were seen as leaders or role models in the community, who were perceived as trustworthy, who exhibited an ability to listen, and who were fathers themselves. Leaders were prompted to think of men with these qualities who they believed might be available and interested. Leaders also indicated that they attempted to find men who had previously shown a willingness to learn.

For clinical supervision, we set up a tiered supervision process with local supervisors and expert consultation (Puffer, under review; Murray et al., 2011). In our approach, potential local supervisors had completed, or nearly completed, university training in medical psychology. A masters-level clinical psychology doctoral student in the US then provided weekly consultation with local supervisors; she, in turn, was supervised by a US and a Kenyan clinical psychologist (PhD-level). All local supervision was done in person. For each counselor's first case, the supervisor and counselor role-played each session prior to the actual session. For the initial sessions, live supervision was provided using Skype; the session room included a tablet with Skype that transmitted to a computer in an adjacent room with the supervisors and consultant. The counselors also attended the live supervision sessions for each other for peer modeling.

After initial sessions with live supervision and immediate feedback, a pre-post session supervision model was planned for subsequent sessions. For this, counselors debriefed with their supervisor for 15-30 minutes after a session to discuss issues. Next, supervisors discussed cases with the US-based consultant via Skype to solidify a supervision plan. Calls occurred weekly lasting 60 to 90 minutes. Then, one on one, in person local supervision took place prior to the next session. Local supervision, lasting around 1 hour, emphasized role plays to practice areas of weakness and new content.

2.2.6 Implementation: Feasibility and Acceptability

Results from multiple steps of the implementation process are presented below. These include the recruitment, training, and characteristics of local supervisors and lay counselors; recruitment, retention, and characteristics of fathers in treatment; and the fidelity and clinical competency with which lay counselors delivered the intervention. We then present qualitative findings on intervention implementation acceptability from the perspectives of fathers and counselors.

2.2.6.1 Supervisors: Recruitment and Characteristics

To recruit local supervisors, nine individuals were invited to a three-day training on the intervention. Selection was based on understanding and application of the intervention, which was evaluated with a written test and a group role play. Two primary supervisors (one female, one male) and one alternate supervisor (female) were selected. Of the primary supervisors, one had a bachelor's degree in medical psychology from Moi University, and one was in his final year within the same program.

2.2.6.2 Lay Counselors: Recruitment, Training, and Characteristics.

Figure 4 presents the counselor recruitment process. Given the large role of religious congregations as a social structure in Kenya, we began the process of recruitment with the Bishop of the Africa Inland Church (AIC) in Eldoret, a large denomination with many churches in the area. The Bishop contacted five AIC pastors in smaller surrounding communities; three expressed interest in participating in counselor recruitment, and two ultimately followed through with the process. Pastors were asked to nominate counselor with qualities described above and were encouraged to list community members both inside and outside of their congregations.

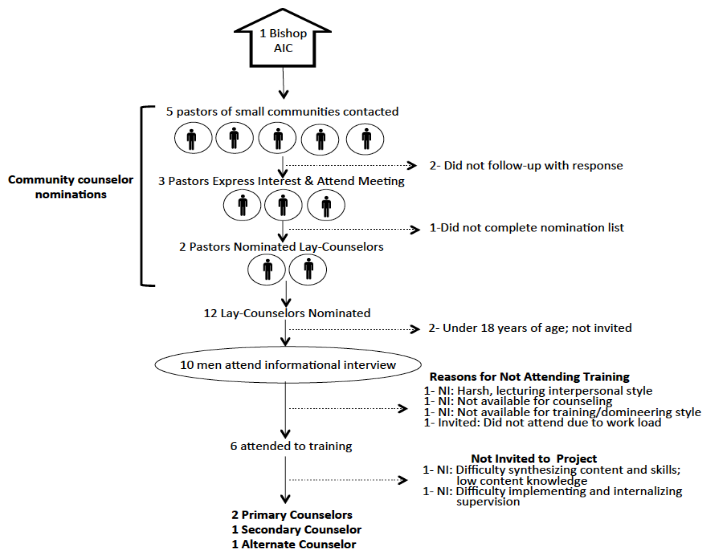


Figure 4: Counselor Recruitment Flow

Pastors nominated 12 men to be interviewed. Two were excluded because they were under 18. The remaining 10 attended the interview. The mean age of applicants was 46.1 years (Range: 33-67 years). Educational background ranged: one completed grade 7, six completed some secondary education, two completed post-secondary certificates—addictions counseling and electrical engineering. Only one participant had any formal training in counseling. Three applicants openly identified as recovered alcoholics. In response to interview vignettes, applicant abilities were evaluated based on clinical presence, problem solving, openness, and listening skills. Based on the interviews, six men were invited to the intervention training. Table 2 presents trainee characteristics, as well as training performance indicators. None had formal counseling experiences, and occupations varied: electrician, security guard, boda boda (motorcycle) driver, construction worker, volunteer Sunday school teacher, and casual farmer.

Table 2: Counselor Trainee Characteristics and Outcomes

ID	Age	Education Level	Pre Training Competency (mean)	Post Training Competency (mean)	Written Exam (%)	Strengths (+) & Areas for Improvement (-)	Result
O	**34**	**Secondary**	**2.6**	**3.4**	**93.2%**	**+: Understands concepts quickly; Receptive, eager for feedback; Strong active listening skills; Clear content understanding; Strong non-verbal skills** **-: Validation and affirmation; Open-ended question**	**Primary Counselor**
JK	**45**	**Certificate**	**2.1**	**3.7**	**96.6%**	**+: Very engaged learner; Understands and connects concepts; Clear content understanding; Ability to focus on strengths; Verbal and non-verbal skills; Calm demeanor; Seeks supervision** **-: Validation; Focus on feelings**	**Primary Counselor**
N	33	Secondary	2	2.6	63.6%	**+:** Active listener; Eager to learn, curious Warm demeanor; Strong reflection & affirmation **-:** Validation; Manual use; Scheduling Activities	Secondary Counselor
H	60	Secondary	1.4	2.4	61.4%	**+:** Active listener; Seeks supervision; Positive demeanor; Strong reflection, summary, & affirmation **-:** Validation; Manual use; Connecting multiple concepts; Focus on strength	Alternate Counselor
K	*45*	*Secondary*	*1.8*	*2.7*	*81.8%*	**+:** *Good open-ended questions; Fair reflection & affirmation; Written understanding of content* **-:** *Nonverbal communication skills; Summary; Engagement; Eagerness to learn; Implementing supervision*	*Not chosen*
Jo	*58*	*Secondary*	*1.9*	*2.6*	*43.2%[a]*	**+:** *Good body language; Good open-ended questions; Open to feedback* **-:** *Difficulty understanding concepts; Verbal communication skills; Focus on Strengths*	*Not chosen*

Notes. a= participant had difficulties writing, so test and answers were administered orally

Trainees completed a 10-day training that also served an evaluative purpose for selecting final counselors. The training was led by a Masters-level clinical psychology doctoral student and the two local supervisors in consultation with a Kenyan Clinical Psychologist (PhD-level) and a US-based Clinical Psychologist (PhD-level). Training relied on participatory didactics, modeling, role plays, and other skills practice exercises.

The training was organized such that in the first half clinicians received training in general clinical skills and in MI and BA, including the underlying rationale and core strategies of each. After that foundation was in place, the intervention-specific manual was introduced. Initial sessions focused on universal skills with a focus on those underlying core MI principles, including: reflection, open-ended questions, validation, affirmation, summarizing, active listening, non-verbal communication, and a stance of empathy and alliance. Next, training applied these skills to specific MI strategies, such as recognizing and responding to prior strengths, solutions, and change talk. Core components and theory behind hypothesized intervention mechanisms were reviewed and practiced, such as identifying values and leading clients to generate activities to break drinking cycles. After universal skills and intervention principles were taught, the next four days focused on the specific intervention content and use of the manual. Each day focused on a different session, beginning with a group manual read through, followed by structured role plays and supervisor feedback, and finally, full session role plays and feedback. At the end of each day, a pair was asked to role play a difficult skill or manual element for the group, and the group then provided feedback on universal skills and counselor strengths.

At the end of training, three applicants were chosen to be counselors. Two were designated primary and one as a secondary counselor who needed some observational training before taking on a case. One alternate also was chosen, and two trainees were excluded (see Table 2). Prior to training, the average ENACT clinical skills rating across all trainees equaled 2 on the 4-point scale, corresponding to “minimally” meeting participant needs, and the post training rating group average was 2.90, falling closer to “moderately” meeting needs. For those chosen as primary or secondary counselors, the post training average was higher, at 3.23, falling between “moderately” and “optimally” meeting needs. Post-training written exam scores ranged from 43.2% correct to 96.6% correct, with an average of 73.3%; the mean for those chosen as primary or secondary counselors was 84.5%. For final selection, the primary counselors further differentiated themselves based on their ability to understand concepts quickly, eagerness to learn, openness to feedback, and consistent use of verbal and non-verbal skills. Lastly, one refresher training on validation and refusal skills was completed with final counselors.

2.2.6.3 Families: Recruitment Characteristics, Attendance, and Participation

We asked six community leaders and the six counselor trainees to refer fathers for treatment. The research team explained eligibility criteria, confidentiality, and techniques for approaching participants in an open, respectful manner, and also provided a brief script to scaffold the project description. At initial contact, recruiters were instructed speak with the father only.

Through this process, 27 fathers indicated a willingness to be contacted by the research team. Nineteen of those were able to be contacted, with one indicating he was not interested. The research team then visited the remaining 18 to assess eligibility, obtain consent, and identify a target child. If the father consented, the female caregiver and target child consent and assent were then obtained. Thirteen fathers and their family members were consented and eligible. Of the five excluded, four were not eligible due to AUDIT scores indicating dependence, and one reporting sobriety for over 2 months. Of the 13 who were eligible and consented, three did not follow through with responding to scheduling requests to complete the first assessment, and one father who met criteria at baseline then reported no drinking for over two months when responding to the pre-treatment assessment. The final sample included nine fathers whose demographic characteristics are presented in Table 3. The mean age of participants was 39. The majority were married and from the Kalenjin tribe. Fathers came from different communities and religious backgrounds; counselors did not know participants prior to counseling.

Eight of the nine fathers completed all treatment session. The other completed the first three sessions, after which he continually could not be reached by the counselor. The 8 who completed treatment had a very high rate of attendance at weekly scheduled meetings (97.6%), with only one father missing a scheduled session, which was rescheduled and attended.

Table 3: Participant Demographics

ID	Age	Education Level	Monthly Income*	Religion	Tribe	Marital Status	HH Size	Child Gender	Child Age	Child Relationship	AUDIT Score	Completed Treatment
306[a]	30	Vocational School	2000.00	AIC	Kalenjin	Married	4	Female	9	Biological	17	Yes
315 [a]	39	Secondary	1000.00	Muslim	Kalenjin	Married	5	Female	8	Biological	18	Yes
308	38	Primary	1000.00	Catholic	Kalenjin	Married	6	Female	8	Non-Biological	19	Yes
312	36	Primary	3000.00	None	Kalenjin	Married	6	Female	10	Biological	17	Yes
322[b]	45	Primary	1000.00	Catholic	Kalenjin	Married	5	Male	15	Biological	9	Partial
324	41	Secondary	6000.00	Catholic	Kalenjin	Married	3	Male	15	Biological	11	Yes
327	34	Primary	500.00	Catholic	Kalenjin	Married	5	Male	13	Biological	19	Yes
317	36	*Did not answer*	1800.00	Catholic	Borana	Non-Married	4	Female	12	Biological	18	Yes
320	48	Secondary	1500.00	Muslim	Kalenjin	Married	6	Male	13	Biological	16	Yes
Grn (mean)	38.6	--	1500.00 (median)	---	---	---	4.9		11.4	---	16.0	---

Notes. Grp =Group mean; AIC= Africa Inland Church (Christian denomination); HH=household; a=first two cases; b= child did not participate

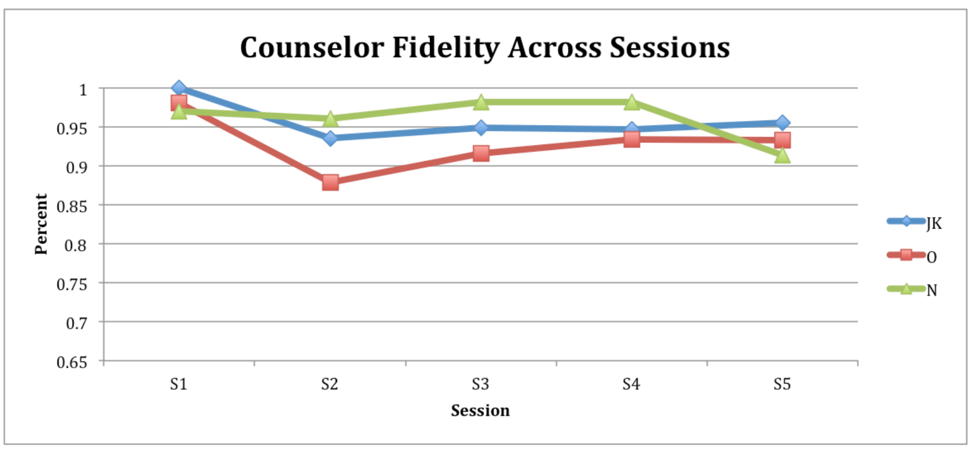
2.2.6.4 Intervention Delivery and Supervision

Counseling was delivered in a small office space nearby fathers' communities. This was done to reduce stigma of hospital-based treatment and increase privacy in comparison with home-based treatment. For one participant, however, the intervention was delivered at his home per the participant's request. With the exception of the participant who did not complete the program, sessions were completed weekly except for a planned holiday break. Average session length was 91 minutes as expected.

Supervision of counselors proved feasible, occurring as planned before and after each session. For the first two sessions of the first two cases, live-supervision using Skype was successful. During the live supervision, fidelity, skills, and clinically significant concerns were tracked in real time. In one instance, the supervisor was instructed to enter a session of a participant who had experienced the death of a friend. On this occasion, the supervisor helped normalize grief and scaffold the scheduling of activities for the day of the funeral. Given high fidelity of initial sessions, live supervision switched to a pre-post session model as planned. Supervisors were able to report on cases accurately and efficiently. Throughout treatment, supervisors took on increased responsibility for decisions making resulting in reduced consultation time to 45 minutes for two cases. Supervisors also incorporated a step of reviewing parts of the counselor's session recordings and transcripts in supervision to guide feedback.

2.2.6.5 Fidelity to Intervention

Averaged across all sessions, fidelity for step completion was 93.8% (SD=1.62; Range=82%-98%). Mean fidelity completion and quality scores by session are presented in Table 4, and step completion across sessions for each counselor is shown in Figure 5. The highest fidelity scores occurred in session 1, followed by sessions 3 and 4. Session 2 appeared to have the lowest fidelity across two counselors indicating material in this meeting may have been relatively more difficult to implement. The overall mean score on quality of how intervention steps were delivered was 3.7 out of 4, corresponding to Moderately (3) to Skillfully (4). Quality ratings were highest for session 4 and lowest for session 2, which is consistent with the complexity of content in these sessions.



Notes. Color differentiate counselors

Figure 5: Counselor Fidelity Across Sessions

2.2.5.6 Counselor Clinical Competency

Across sessions, counselors achieved an average score of 3.2 (SD=0.26) on general clinical competencies as measured by the adapted ENACT scale, which falls between

“Moderately” and “Skillfully” meeting patient needs. On MI-specific competencies, the average score across sessions was 3.5 out of 5 (SD=0.36; Range=3.1-4.1), falling between “Attending to half of opportunities” and “Missing some opportunities.” Highest average ratings for MI skill use were for sessions 4 and 5. Table 4 presents average ENACT and MI-specific competency scores by counselor and by session.

Table 4: Indicators of Counselor Intervention Delivery

Session	Fidelity (%)	Quality of Steps [1-4]	Competency: ENACT [1-4]	Global MI Spirit [1-5]
1	98.70%	3.67 (.29)	3.13 (.27)	3.42 (.33)
2	92.22%	3.54 (.26)	3.07 (.37)	3.31 (.42)
3	94.87%	3.72 (.08)	3.14 (1.08)	3.41 (.57)
4	95.26%	3.82 (.13)	3.42 (1.16)	3.86 (.46)
5	93.77%	3.80 (1.76)	3.36 (1.71)	3.85 (.45)
Total	93.80%	3.67 (.18)	3.20 (.27)	3.53 (.36)

2.2.6.7 Qualitative Results: Feasibility and Acceptability

Qualitative interviews demonstrated promising results related to feasibility and acceptability. Data are first presented from the families’ perspectives, followed by data from the counselors’ perspectives.

Family Perspectives. Overall, fathers shared positive feedback related to counselor characteristics, intervention content, and the session format and materials. All fathers indicated an acceptance of counselors, reporting that having counselors who were not from their community was not concerning. Half of the fathers explicitly stated that they felt comfortable sharing with their counselor, and over half noted that there were no issues they felt were too difficult to discuss. Fathers expressed positive feelings toward their counselors, with one father saying, “I felt very good because he is like a parent …like my own parent... I was extremely happy to be with him. I didn’t have an issue with him even once.” Another participant reported, “I was very happy, and I love him very much.” Prior to starting treatment, a few fathers reported feeling uncertain and afraid of counseling but seeing changes in themselves and at home increased their comfort. Their relationships with their respective counselors were also cited as reasons for increased confidence in treatment, as well as motivation for attending treatment and making changes. Speaking to this, one father expressed, “I was motivated to know that I have somebody who is concerned about me …This fact kept lingering in my mind, and it made me say to myself, ‘given a chance, it would be good to adhere to his guidance’.” Some fathers also described feeling happy to have someone willing to meet with them weekly, and one father specifically appreciated his counselor’s openness.

Overall, participants were satisfied with the duration of sessions, the length of the counseling, and the schedule. While one participant indicated wanting to continue counseling with his counselor. A few participants expressed a desire for their counselors to continue providing counseling to others in the community in need. When asked about their counselor’s performance, participants emphasized their gratitude, with most stating they did not have any suggestions for changes. One participant reported he would have preferred if his counselor came from a "more religious" background.

When asked to recall and reflect upon the most helpful content of the intervention, many noted learning to understand pathways of addiction, discussing their vision for their lives, tracking their drinking, and learning skills to reduce alcohol. All fathers noted planning activities to avoid alcohol as a treatment lesson taught. For instance, one father reported, "Spending time with my children helped me avoid being out there with other people who could have engaged me to bad behaviors." Most fathers specifically noted learning about drinking "urges," with one father describing,

> I came to learn that there's this thing known as [an] urge…that triggers one to do thing[s]… then you [do it] that will be like a vicious cycle….[going] back to the same habit [drinking] because of bad thoughts so it keeps going round and round. Therefore it is important when one experiences such an urge to just ignore it and refrain because by doing so one is able to accomplish a lot of positive things.

All also reported acceptability and utility of session materials, such as the notebook.

Counselor Perspectives. Counselors' descriptions of their experiences indicated a high level of acceptability in terms of content and implementation. Counselors described that they felt good seeing positive changes in their clients, learning new things, and being part of the solution in people's lives. They all reported that the program helped them to see individuals with drinking problems with more empathy and approach others without "harshness." One counselor noted that prior to the intervention he believed prayers were the only avenue to help others reduce drinking, but now realizes there are also other ways. In addition to describing positive changes in clients, counselors noticed changes in their own lives as a result of using the skills taught in the intervention; these included more open communication, improved time management, and increased attention to family.

When asked for their opinions on implementation methods, all counselors indicated that they wanted the program to be longer to allow for more repetition of material and more time to help fathers practice the skills. Two counselors also suggested the program should involve participants' family members in treatment to help fathers stay accountable to reducing drinking. Counselors all also reported that they would prefer to have more sessions per week, trainings more frequently, and more cases in order to build mastery. However, alongside this, one challenge all counselors noted was balancing their personal schedules and jobs with counseling duties.

Regarding specific program components, treatment characteristics counselors perceived as most helpful ranged from the general to specific, including: building a strong counselor-participant relationship, the participant's feeling of acceptance, tracking and scheduling specific activities, consistent use of the path tracking specific behavioral sequences (treatment rationale), and assigning homework. Counselors noted that the section discussing masculinity and past family models was the most difficult to deliver. Two noted that they felt like this was an important component but that participants may have felt embarrassed discussing these issues. Lastly, counselors indicated that the supervision process was acceptable. They felt the in-person supervision prior to the session was helpful to feel prepared and confident for session.

2.3 Discussion: Development, Acceptability, and Feasibility

This study presents an integrated MI and BA-based treatment for addressing co-occurring alcohol use and drinking-related problems affecting families for use with fathers in low-resource settings. It further contributes to the literature on implementation strategies for addressing these issues. The intervention resulting from qualitative work and review of evidence-based practices was rooted in MI and BA's functional principles of change, with strategies integrated to address issues of gender in this context. MI strategies have been recommended for use in LMICs (Patel et al., 2007; mhGAP, 2017; Nadkarni et al., 2016), and BA strategies are also increasingly being employed in low-resourced settings both in HICs (Daughters et al., 2008) and LMICs, particularly for delivery by lay providers (Patel et al., 2017; Murry et al., 2014; Chowdhary et al., 2014). This study adds to these findings and their continued potential for use in low-resourced settings.

This intervention and the implementation strategies used in this initial pilot study proved largely feasible and acceptable in a low-resource community setting. One central feasibility question of the program was whether we could engage and retain men, in this case fathers, in treatment. These questions were critical given substance users and men are often difficult to engage in treatment (Good, Thomson, & Brathwaite, 2005; Baker et al., 2014). Results were positive for both. Attendance rates in particular suggest that these treatment strategies, perhaps particularly MI, may hold promise for completing this treatment, and potentially others, with this challenging population. This would be consistent with literature demonstrating MI's efficacy improving treatment adherence and attendance with difficult to treat groups (Crane, Eckhardt, & Schlauch, 2015). Specifically, using MI to engage fathers in family interventions could help answer calls to increase father involvement in those treatments as well (Panter-Brick et al., 2014).

Further, integrated MI and BA proved feasible for delivery by lay counselors suggesting this type of component could be extended to other settings. Although the use of MI in combination with CBTs is not new in HICs, it is typically used as a separate component before the main intervention content to promote engagement or adherence (Kaminer, Connor, & Curry, 2008; Westra, Arkowitz, & Dozois, 2009; Arkowitz, Miller, Rollnick, & Westra, 2008). It is less common to weave MI into treatments throughout in order to maintain engagement with content, particularly in LMICs (Balán, Moyers, & Lewis-Fernández, 2013; Sorsdahl et al., 2015). One facilitator of the observed success of lay counselor adhering to such an integrated protocol could be the training on using MI and BA intervention change principles flexibly before beginning a more narrow focus on manual content; we also included MI-based manual prompts to help facilitate true integration. If this was the case, placing training emphasis on counselors' understanding of why components are being used may be useful in the delivery of other interventions that use MI or generally require some clinical flexibility. This may have implications for counselors' abilities to then use clinical judgment over time to implement programs with both fidelity and clinically appropriate flexibility, which can aide dissemination efforts (Kendall & Beidas, 2007; McHugh, Murray, & Barlow, 2009).

Despite overall successful intervention delivery, challenges did arise. When quantitative delivery indicators, GTSs appeared to be most difficult to deliver based on ratings. This was corroborated by the counselors during qualitative interviews who expressed difficulty implementing this material, in part because questions felt too sensitive. No participants reported any adverse responses to this content but may have felt inhibited in giving any negative feedback. Previous interventions typically use these strategies in a group format and tend to focus on shifting inequitable gender norms in order to reduce gender-based violence and reduce sexually risky behavior (Dworkin et al., 2013). Our use of strategies differed in the individual format and shorter duration of the content, which may have led to lower comfort of counselors during delivery (Pulerwitz et al., 2015; Dworkin, Fleming, & Colvin, 2015). Future iterations of this intervention could lengthen or further adapt these strategies. One idea for a relevant expansion is informed by a qualitative study finding that subtle changes in masculinity were closely tied to economic provision (Gibbs et al., 2015). This explicit link to economic provision and masculinity may be beneficial in the current intervention given the importance of those issues in this context; discussing the expectations of being a provider may also be a less "sensitive" start point for counselors in comparison to discussing the client's family.

Additionally, one participant did not complete treatment. Exploring indicators affecting attrition may elucidate factors to consider for enhancing engagement. Qualitative interviews with this family suggested internal, interpersonal, and environmental factors may have played a role. First, living in close proximity to an "alcohol den"— a home that produces local brew— likely created an environmental barrier (Scribner, Cohen, & Fisher, 2000). Second, it appeared the participant's wife occasionally worked in this home producing alcohol, which seemed to contribute to her ambivalence about the father joining treatment (O'Farrell, 2012). Third, cultural ceremonies for the son's circumcision likely created a further pressure to use alcohol given such celebrations typically involve alcohol. Lastly, the father's level of readiness to change may have been lower than other participants, as indicated by less willingness to travel to the sessions but requesting them at home. Taken together, these intersecting factors may have discouraged treatment engagement.

2.3.1 Limitations and Future Directions

A clear limitation is the small sample of both clients and counselors, making it difficult to generalize findings. A study strength was the community-based approach, though certain elements of our approach were narrow, such as working through religious leaders for counselor recruitment rather than a wider variety of leaders. These types of choices were necessary in such a small study but limited our ability to test the feasibility of a wider range of implementation options. Another limitation is having only newly trained counselors, which curbs our ability to understand how skills may differ across experience levels or unfold over more cases. Lastly, all fathers consented to participate in the study, which might suggest some level of willingness to change behaviors compared with those who were eligible and did not start. As such, more research is needed on the feasibility and acceptability of this intervention among men with lower levels of readiness or perhaps more environmental barriers to participation.

This study, in addition to pilot clinical outcome data presented in Study 2, demonstrates preliminary, but promising, results that support the utility of pursuing the next set of goals and research questions. This study established the intervention content, and its basic feasibility and acceptability in the target population with lay providers.

However, the implementation model, including supervision procedures, was not yet designed in a way that allows for scalability—a major consideration for the next steps in testing effectiveness (Eaton et al., 2011). As such, next steps should prioritize determining structures and procedures that better consider sustainability.

2.3.2 Conclusion

In this study, we aimed to develop an alcohol-use and family engagement intervention and explore preliminary evidence for its feasibility and acceptability. Results suggest that the five-session intervention combining MI, BA, and GTS was feasible and acceptable. Participants were successfully recruited and participated successfully. Both counselors and participants reported high levels of satisfaction and perceived the treatment to be helpful and rewarding. Lay counselors were also able to implement the intervention as evidenced by high treatment fidelity and competency counseling . Findings further suggest the potential for the implementation strategy of recruiting local men seen as trusted community role models to be counselors.

3. Study 2: Intervention Pilot

The primary purpose of this paper is to examine the intervention impact on alcohol use with a multiple baseline single case series deign, as well as to investigate the magnitude and direction of change of the intervention on drinking-related problem behaviors affecting the family and father engagement using pre-post surveys and qualitative post-interviews with the father's wife and child. We also explore pre-post change on secondary outcomes that include the following: general family functioning, relationship quality, harsh treatment, individual mental health, and indicators of treatment motivation, such as readiness and confidence in change.

3.1 Methods

3.1.1 Design

A partially non-concurrent multiple baseline single case series design was used to evaluate the impact of the intervention on the primary outcome of alcohol use. A pre-post analysis was also conducted to investigate changes on drinking- and family-related behavioral outcomes, as well as on secondary outcomes.

The multiple baseline design allows us to examine within-subject change across conditions replicated across different individuals using a number of essentially "mini" AB designs through repeated measures (Smith, 2012). We use the term "non-concurrent" for our specific design because the baseline and treatment began at different times for each patient, which mirrors how treatment may typically unfold in a real world setting. In this study, participants' enrollment positions were randomized to different baseline start dates, and start dates were staggered by one week. There are several advantages to using this design for this study. First, as this is the first attempt to examine the impact of a novel intervention for delivery by lay-providers in a community setting to reduce alcohol use and improve family-directed beahivors, a larger trial would be premature. Second, such a design controls for the passage of time and allows a cause-and-effect association to be established between treatment and outcomes with partipicants serving as their own control (Barlow & Nock, 2009; Shahar, Bar-Kalifa, & Alon, 2017).

3.1.2 Participants

We delivered the intervention to a small sample (n = 9) of fathers using alcohol who have children ages 8 to 17 in Kenya. Each man's spouse/partner and one child were also enrolled to complete assessments about father's behavior, family relationships, and individual mental health. All nine participants, as well as their partners, received repeated measures assessing the primary outcome of alcohol use. Of those, seven participated in the full multiple baseline single-case series study, including repeated measures across outcomes. The remaining two families were the first two pilot families and completed only pre-post assessments on the other study outcomes.

Inclusion criteria were (a) male caregiver (referred to as fathers) identified as responsible for the care of a child between the ages of 8 and 17 years of age; (b) problematic drinking indicated by a score of 8-20 on the Alcohol Use Disorder Identification Test (AUDIT; Babor et al., 2001); (c) alcohol use within the past 2 months; (d) willingness to participate in study and sign a consent form; (e) willingness to have one child and the other primary caregiver of the child participate in study assessments; (f) willingness of other primary caregiver and child to consent to participate. Exclusion criteria were: (a) living in a home that brews alcohol; (b) has not had any alcohol in over two months; (c) AUDIT score below 8; (d) alcohol dependence defined as having an AUDIT score above 20 and/or exhibiting visible symptoms of withdrawal or past history of hospitalization when attempting to reduce alcohol.

3.1.3 Participant Recruitment

Nine fathers engaging in problem drinking participated in treatment. Community leaders and the lay counselors for the study, referred to as leaders, identified potential study participants. Prior to identifying participants, the research team met with leaders. During these meetings, the study, eligibility criteria, and techniques for approaching participants were discussed. Leaders then brainstormed potential participants with the research team in order to help determine if they would likely be eligible and, a script was given to scaffold initial contact. Leaders identified 27 fathers who indicated a willingness to hear about the project. Nineteen of those 27 were able to contacted by the research team to set up an initial visit, one of whom indicated he was not interested after hearing more. A research staff member then visited interested fathers to assess eligibility, obtain consent, and identify a target child. Child identification was based on child age then child availability; if multiple children met these criteria, the oldest child was chosen. If the father was eligible and consent was obtained, then female caregiver and child consent and assent were obtained. For men who were not eligible due to high AUDIT scores, referrals and brief psychoeducation were provided. Enrollers were individuals with a bachelors degree or higher in psychology who had completed a training on identifying symptoms of withdrawal and dependence, and on providing pscyhoeducation and recommendations based on WHO guidelines (Babor et al., 2001).

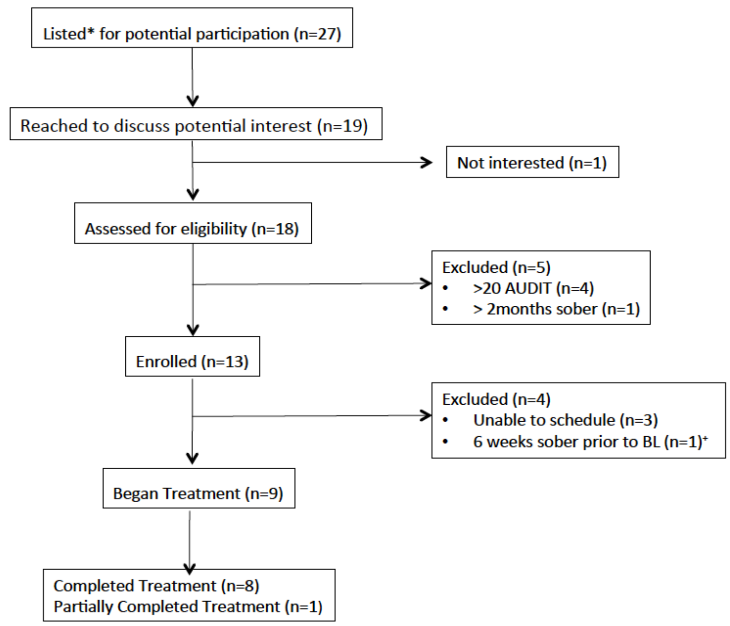


Figure 6: Participant Flow

3.1.4 Lay-Counselor Recruitment

To recruit lay counselors to deliver the intervention, we aimed to identify men who were fathers, and who had no prior mental health training. Community leaders identified 10 men who were seen as role models in their community and exhibited certain qualities, such as an ability to listen before providing advice. We interviewed this group, invited six to a 10-day training, and made final selections based on training performance. We selected three counselors to receive supervision and deliver the treatment, and one alternate to serve as a potential replacement in the unexpected case that the others would become unavailable. Counselors were selected based on their counseling skills assessed with the ENhancing Common Therapeutic Factors Scale

(ENACT; Khort et al., 2015), understanding of intervention theory and content, manual use, receptivity to supervision, and willingness to learn. Procedures, recruitment, and characteristics of lay-counselors are described in-depth in Study 1.

3.1.5 Treatment

The implemented treatment is a brief, value-driven program to reduce alcohol use and improve family-directed behaviors among fathers engaging in problem drinking for delivery by lay-providers. Development for the Kenyan context was based on a multi-stepped process. It began with qualitative analysis to understand contextually-specific drivers of alcohol use and family disengagement among fathers. This was followed by a systematic review of alcohol use and family-related treatments, initial manualization, then collaborative development with a local team in Kenya, and a brief pilot. (See Study 1.) From the development process, MI and BA were identified as optimal treatment components, in addition to GTS that focuses on expanding conceptions of masculinity. These strategies were combined and integrated, and a family focus was emphasized throughout.

A manual guides the 5-session intervention. Figure 1 presents the hypothesized theory of change, and Table 1 presents the intervention content. The intervention begins with MI strategies to encourage engagement and readiness to change, as well as a discussion of the treatment rationale to demonstrate the connection between events, feelings, urges, and drinking behavior. This rationale guides later discussions about the participant's drinking patterns. Remaining sessions consist of BA with MI integrated throughout. BA targets positive reinforcement to reduce drinking behaviors through the scheduling and completion of value-driven activities. Fathers are prompted to choose both a family-value and a self-value to guide activity scheduling. A self-focused value allows for the scheduling of other pleasurable non-drinking activities and/or coping activities, while family-focused values encourage behaviors with or related to the family. Additionally, early in treatment GTSs are included to expand traditional ideas about manhood to help clarify family-related values and to increase motivation to complete family activities. Lastly, refusal skills are included in sessions 3 and 4 to aide in the prevention of a common drinking trigger—peers. Although developed for use in Kenya, it is anchored in evidence based principles conducive to adaptation for other settings.

The two pilot cases (families 306 and 315) received 4-sessions of the intervention and did not receive refusal skills, as these were added in response to their experiences.

3.1.6 Procedures

3.1.6.1 Supervision

We followed a tiered supervision approach (Puffer et al., under review; Murray et al. 2011). In this approach, mental health professionals provide consultation to local supervisors who are trained to supervise lay counselors. In this study, three supervisors were selected who had a bachelor's degree in psychology. Each also demonstrated an understanding of the intervention, counseling competencies, and strong communication skills in a 3-day supervisor group interview and training. Local supervisors consulted with a US Masters-level clinical psychology doctoral student weekly to review cases and determine next steps of supervision. The US consultant was in turn was overseen by a US-psychologist and a Kenyan-psychologist on an as needed basis.

3.1.6.2 Training

Counselors received 10 days of training led by a Masters-level clinical psychology doctoral student in consultation with the US and Kenyan clinical psychologists. Training focused on core clinical and treatment specific skills. Role play and feedback were emphasized throughout. One refresher training was conducted led by the local clinical supervisors in consultation with the Masters-level clinician focused on validation, summary, refusal skills, and general team-building.

3.1.6.3 Data Collection

Surveys were administered verbally by Kenyan research assistants not involved in the intervention who were trained in survey administration and research ethics. Survey data were recorded by the enumerators using pencil and paper; no names were included on materials. Qualitative interviews were administered by a different research assistant specifically trained in that methodology. All data collection activities were conducted with individuals in private locations. Therapy sessions also were audio recorded, and a research staff member then transcribed each of the sessions into English.

3.1.7 Measures

In the following sections we describe both primary and secondary outcomes. We first describe measures of alcohol use, which were the primary outcomes assessed at multiple time points throughout the study; these occurred weekly during the month prior to the intervention, each week during the intervention, and again weekly after the intervention. We then describe the other outcomes administered at two time points: pre-intervention (one month prior to initiation of intervention) and 1-month post-intervention among multiple reporters— the male caregiver (MCG), the female caregiver (FCG), and one child.

3.1.7.1 Alcohol Use

Problem Drinking: Male Caregiver Report. For male caregivers, initial eligibility was screened using the 10-item Alcohol Use Disorders Identification Test (AUDIT; Barbor et al., 2001), which has been previously validated in Kenya (Saunders et al., 1993). Items assessed frequency and patterns of drinking to determine levels of risk. Responses were sum scored with higher scores indicating more problematic drinking behavior (α=0.89). On this measure, scores in the 8-15 range represent a medium level of alcohol problems and 16-20 a high level. Scores above 8 are considered indicators of hazardous use, while scores above 20 suggest further evaluation for alcohol dependence.

Daily Alcohol Use and Spending: Male Caregiver Report. We used the Timeline Followback (TLFB; Sobell, Sobell, Leo, & Cancilla, 1988) —a retrospective, calendar-based assessment— to assess amount of alcohol consumed (in milliliters, mL, of ethanol) and amount of money spent on alcohol (in Kenyan Shillings, KSH) at every assessment point and intervention session. We administered an adapted TLFB developed and validated by Papas and colleagues (2010; 2011) for use in Eldoret, Kenya. This version is helpful in this context as it allows the collection of commercial alcohol use data, as well as estimates of ethanol consumed through "local brew;" these include chang'aa, and busaa (Kiswahili names)—two distinct types of locally-brewed drinks.

Amount of commercially-produced alcohol consumed is measured by number of standard commercial drinks. From this count, total ethanol is based on standard drink equivalents of around 17.7 milliliters (mL) ethanol per drink. Alcohol content for local brew is then estimated by collecting data on the monetary amount spent, borrowed, or owed to purchase the brew, as that is a more standard indication of ethanol content; volume of liquid in "one drink" of local brew is very inconsistent. The amounts spent on changaa and busaa, respectively, were converted into mL ethanol based on Kenyan shilling (KSH) to ethanol conversions, which were created based on local brew samples taken from five Eldoret communities for the validation of this measure (Papas et al., 2010). Conversions are 0.57 mL ethanol per 1KSH of bussa and 0.67 mL ethanol per 1KSH of changaa. Ethanol estimates across commercial drinks and local brew were summed to yield a total amount of mL ethanol consumed within a given time period. These data also yielded a dichotomous variable of whether or not a participant engaged in any drinking on a given day (yes/no).

To assess spending on alcohol, questions about local brew assessed for amount of alcohol and spending simultaneously as described above. We then added a question to the assessment of commercial alcohol use about amount spent. These were summed, resulting in a combined estimate of amount spent across alcohol types in a given period.

For both amount consumed and amount spent, repeated measures were administered. For the majority of participants this was assessed for the past 14 days at the first assessment time point. Then during the remaining baseline, intervention, and multiple post-intervention assessments, the participant reported on the previous 5 to 8 days between the assessment time points. (If a participant missed an assessment, we assessed up to 14 days since the last interview.) For the two first pilot cases, the same data were obtained but their alcohol use for the months pre- and post-treatment was assessed in a slightly different way since there were not multiple baseline assessment interviews. Rather than assessing their use every week for the 30 days prior to the intervention, they reported their use for the past 30 days in one assessment. The measurement time points during the intervention were the same across all participants.

Daily Male Caregiver Alcohol Use: Female Caregiver Report. We developed a calendar-based measure to assess female caregiver report of male caregiver drinking patterns. The structure and prompts mirrored that of the TLFB, but answer choices were provided for each question. The tool assessed whether the father drank with corresponding answer choices of "Yes", "No", "Probably Yes", "Probably Not." If an answer of yes was indicated, then the female caregiver was asked whether the father was drunk, "Yes" or "No." We examined number of times the father drank yes (1) or no (0) within a time period to calculate a proportion of days drinking for each phase.

To assess days drinking, repeated measures were administered. For the majority of participants the was assessed for the past 14 days at the first assessment time point. Then during the remaining baseline, intervention, and multiple post-intervention assessments, the partners reported on the previous 5 to 8 days between the assessment time points. (Again, if a participant missed an assessment, we assessed up to 14 days since the last interview.) For the two first pilot cases, they reported their husbands' use for the past 30 days in one assessment interview. The measurement time points during the intervention were the same across all female caregivers.

3.1.7.2 Drinking- and Family-related Behavioral Outcomes

Father's Drinking-related Problem Behavior (DRPB): All Reporters. A 17-item measure assessed indicators of father engagement in alcohol-related problem behaviors. These include conflict, violence, disruption to family routines/activities, or withdrawal at the family and subsystem-level in the context of drinking, as well as perceptions of the father's drinking behavior in the community, drinking behavior, and dangerous alcohol-seeking behavior. We developed the scale for this context based on qualitative data. Items ask about the frequency of behaviors in the past month on a 5-point scale with points corresponding to "Never" (0), "Less than a month" (1), "2-4 times a month" (2), "2-3 times a week" (3), and "4 or more times a week" (4). Items included: How often have you been drinking so much that: you could not take care of your family as well as you would like to?; you had no time for your family?; How often have you quarreled with your children when you were drunk? Fathers reported on their own behavior, while female caregivers and youth reported on frequency of the male caregivers' behaviors. Internal consistency of was high [MCG α= 0.95; FCG α= 0.94; Child α= 0.95]. Scores were averaged for each reporter; higher scores indicated more frequent problematic behavior. The scale was administered at the pre and post assessment points.

Missed Family Time: All Reporters. Two locally developed items assessed family time missed because the male caregiver was drunk or drinking. These included:

How often have you/your husband/your father missed dinner at home because you/he were/was drinking?; and, How often have you/your husband/your father missed planned family time because you/he were/was drinking (e.g., missed meeting, planned to talk)? Answers ranged from 0 to 4 with 0 corresponding to "Never" and 4 to "4 or More Times a Week." Responses were averaged for each reporter. Reliability ranged by reporter [MCG α= 0.92; FCG α=0 .28; Child α=0.95]. Items were administered across reporters' during pre and post assessment points.

Paternal Involvement and Instrumental Support: All Reporters. The involvement subscale of the Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996) assessed father level of participation in their child's life, such as father attendance at child activities or help with homework. Items were adapted to enhance local acceptability, understandability, and completeness prior to use with minor adaptations. The APQ evaluates the frequency of father involvement on a 5-point scale from "Never" (0) to "All the Time" (4). Female caregivers (α=0.85) and children (α= 0.92) reported on father behavior, and fathers (α= 0.78) reported on their involvement with the target child. The APQ was administered during pre and post assessments.

3.1.7.3 Indicators of Treatment Motivation

The following constructs were assessed to evaluate factors hypothesized to reflect men's level of treatment motivation. These were evaluated at the pre and post assessment time points.

Readiness to Change: Male Caregivers. Readiness was measured by two different tools. The first was the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller & Tonigan, 1996; α= .79). This is a 19-item measure of readiness to change in alcohol users that yields three sub-scale scores: Recognition (Re; α=0.48), Ambivalence (Am; α=0.48), and Taking Steps (Ts; α=0.87). Items are rated from (1) "No! Strongly Disagree" to (5) "Yes! Strongly Agree." Prior to use, items were adapted and assessed for acceptability, relevance, comprehensibility, and completeness using an iterative process that began with lexical back translation and expert review and a final stage of focus grouping with local community members. Higher scores within each subscale indicate increased readiness for change. Given the low alpha scores for the Ambivalence and Recognition subscales, only the Taking Steps sum scores are reported.

Additionally, we administered a 1-item readiness to change question on a 1-10 scale with 10 indicating complete readiness (Hesse, 2006).

Confidence in Ability to Change: Male Caregivers. Father's confidence in his ability to change drinking habits was assessed with 1-item on a 10-point scale with (1) indicating "Not At All Confident" and (10) indicating "Very Confident."

Gender Role Beliefs: Male Caregivers. The Gender-Equitable Men's Scale (GEM; Pulerwitz & Barker, 2007) was administered to assess men's beliefs about gender norms and gender roles (α=0.56). Items on this scale range from 1, "Agree", to 3, "Do not agree." Items assessed beliefs regarding domestic duties and acceptable levels of violence towards women. These include, 'A woman should obey her husband in all things,' and 'There are times a woman deserves to be beaten.' Higher scores correspond with more equitable gender views. This scale has been previously used in Kenya to measure inequitable attitudes (Stephenson, Bartel, & Rubardt, 2012).

Willingness to Engage in Treatment: Male and Female Caregivers. Father willingness to participate in psychological treatment was assessed with 1-item: "How willing are you to engage in treatment for yourself?" Female caregivers were asked: "How willing do you think your husband is to engage in treatment for his problems?" Willingness was evaluated with a 10-point scale with 1 indicating Not At All Willing and 10 indicating Very Willing.

3.1.7.4 Secondary Outcomes: Family Relationships and Individual Mental Health

In this section we describe measures of secondary outcomes that were administered at pre and post assessment time points.

Family Functioning Problems: All Reporters. Overall family functioning was assessed with 25-items, such as "How often does your family have quarrels?" Items related to issues of family structure, emotional climate, and communication. These items were locally-developed based on qualitative work and used in a prior family intervention study in Kenya (Puffer et al., 2018). Participants viewed a picture of ascending stairs and responded to each statement with a number from 1 to 10 that represented steps on the stairs. The anchor for Step 1 was "A little" and for Step 10 was "A lot." Caregivers and children completed identical versions of the questionnaire. Scores were averaged by reporter (MCG α = 0.95; FCG α = 0.96; Child α = 0.95), with higher scores indicating poorer family functioning in this study.

Household Decision Making: All Reporters. A 3-item scale assessed family members perceptions of who makes decisions in the household (Leon & Foreit, 2009). Responses fall on a 3-point scale with 0 indicating "You" or "Your Father", 1 corresponding to "Your spouse" or "Your mother", and 2 corresponding to "Together/Jointly." Items were averaged by reporter; higher scores were interpreted as higher joint decision making (MCG α= 0.66; FCG α = 0.74; Child α = 0.85).

Couple Relationship Quality: Male and Female Caregivers. Caregivers (MCG α =0.86; FCG α =0.94) completed a 26-item measure assessing relationship conflict, warmth, communication, hostility, and openess within the past month. Items included the following: “How often have you and your partner quarreled?” and “How often do you talk freely with your husband/wife about personal emotions?” Fifteen of the items were from the Dyadic Adjustment Scale (DAS; Spanier et al. 1976), and 11 items were locally developed. Participants responded on a 6-point scale from "None of the time" (0) to "All of the time" (5). We averaged responses to these items separately for reporters.

Harsh Marital Interactions: Male and Female Caregivers. Fathers’ harsh interactions towards his partner were assessed with 8-items from the Conflict Tactics Scale (CTS; Straus et al. 2003 MCG α = 0.44; FCG α = 0.72). Female caregivers reported on the frequency of multiple types of physical abuse within the past month as perpetrated by the male caregiver on a 5-point scale with 0 indicating “Never” and 4 indicating “More than 8 times.” From the same items, male caregivers reported on their use of these behaviors. Responses were averaged by respondent.

Father-child Relationship Quality: All Reporters. All participants completed a 35-item survey assessing aspects of the father and child relationship including paternal warmth, acceptance, rejection, and neglect. Twenty-five items came from the Parental Rejection and Acceptance Questionnaire (PARQ; Rohner & Khaleque, 2005), and ten were locally-developed. For each item, participants were first presented answer choices of “True” or “False;” dependent on the answer, they were then prompted to choose “Almost always true/false” or “Sometimes true/false.” This yields a 4-point Likert scale from (1) “Almost never true” to “Almost always true” (4). After appropriate items were reverse scored, responses on the scale were summed then averaged for each participant (MCG α = .93; FCG α = .98; Child α = .97), such that higher scores indicate more positive quality relationships for this study.

Child Maltreatment: All Reporters. Fifteen-items from the Discipline Interview (DI; Lansford et al. 2005) were administered to male caregivers (α = 0.84) and children (α = 0.85) to assess child maltreatment perpetrated by fathers. We asked children to indicate the frequency of physical abuse, neglect, and coercion into dangerous activities in the past month. Children responded on a 4-point scale from "never" (0) to "almost every day" (4). We averaged responses to these items yeilding scores ranging from 0 to 4. We asked fathers how often they engage in the same behaviors and caluclated an average score. For female caregivers, male caregiver maltreatment was assessed using one item from the DI using the same scale. She was asked: “"How often does your husband beat your child in the bottom or elsewhere on the body with something like a belt, hair brush, stick, or other hard objects?"

Caregiver Mental Health: Male And Female Caregivers. Caregiver mental health was assessed with the Patient Health Questionnaire-9 (PHQ-9; Kroenke & Spitzer, 2002). The PHQ-9 was designed to assess depression and has been previously validated in Kenya (Monahan et al., 2009). Participants were asked if they had experienced certain symptoms over the past two weeks rated on a 4-point Likert scale from 0 to 3 (Not at all, Rarely, Sometimes, Often). Scale internal reliability for male caregivers was 0.91 and 0.93 for female caregivers. A sum score was calculated for each caregiver.

Child Mental Health: All Reporters. Child mental health was assessed by child-report and caregiver-report using the 19-item Brief Problem Monitor (BPM), which assesses children's functioning across multiple symptom domains, including internalizing, externalizing, and attention problems (Achenbach et al., 2011). Internal consistency was high for caregivers and lower for children (MCG α =0.96; FCG α =0.76; Child α =0.43). Participants responded on a 3-point scale: "not true" (0); "somewhat or sometimes true" (1); "very true or often true" (2). Responses were sum scored to produce a score for each reporter, with higher scores indicating more mental health symptoms.

3.1.7.5 Semi-structured Qualitative Interview (Post-Treatment)

Following treatment, qualitative interviews were conducted individually with each participant. For fathers, interviews explored experiences of therapy and perceptions of their individual change and changes within the family. For partners and children, interviews explored their perceptions of father and family change. Interviews were conducted in Swahili, audio-recorded, and transcribed verbatim into English.

3.1.8 Analysis

All quantitative analyses described below were conducted in R v2.13.0 (Team RC). Group analyses were conducted with the eight treatment completing participants.

3.1.8.1 Intervention Impact on Alcohol Use: Mixed-Effect Hurdle Model

A central aim of the analysis was to examine changes in alcohol use during the treatment and follow-up period. Alcohol use was operationalized as the (1) the amount of days drinking (yes/no) and (2) the amount of ethanol consumed in mL on days of use. To investigate changes, the analysis needed to incorporate critical aspects of the data typical of daily substance use count measures (Atkins, Baldwin, Zheng, Gallop, & Neighbors, 2013). The first aspect to consider was the large number of observations, as the average number of observations per person was 74.29 (min = 57, max= 90). Second, the distribution of alcohol use data exhibited a clear stack of zeroes, which represented non-drinking days; 65% of the total number of observed days were such non-drinking days. Finally, the distribution of non-zero alcohol consumption was strongly skewed (2.75), ranging from 6.70 mL consumed to 352.00 mL consumed. To account for these characteristics, we fit a mixed-effects negative binomial hurdle model to examine the impact of treatment on alcohol use during the intervention and follow-up period. With this approach, an outcome is modeled in two-parts or submodels. The first is a logistic regression that models the probability of having a non-drinking day (i.e., zero vs. non-zero consumption), and the second is a negative binomial regression for non-zero counts to model the amount of alcohol consumed on drinking days. Random intercept terms were included in both submodels to account for variance of observations nested within a person. The model was fit using the glmmTMB R package (Magnusson et al., 2017).

3.1.8.2 Individual Change Descriptions

To examine patterns of results across individual cases, descriptive statistics were calculated for average mL ethanol consumed per day, self-reported proportion of days *not* drinking, and spending on alcohol. Alcohol consumption variables—amount consumed and proportion of days abstinent— were calculated for the time period prior to the intervention, during the intervention, and after the intervention for each case; amount spent was examined pre-post. For mL ethanol, we calculated the percent decrease in mL ethanol consumed from baseline to the period during treatment and post treatment. To investigate changes in money spent on alcohol, an average amount spent per day was calculated for the baseline and follow-up periods. To visualize the data, the proportion of days drinking during the baseline, treatment, and follow-up period and their standard error were graphed, and mL ethanol consumed by period was plotted.

For drinking- and family-related behavioral outcomes, father involvement, and missed family time due to alcohol use, we calculated pre and post intervention scores by reporters to examine direction and magnitude of change per family. To examine patterns of co-occurring changes in alcohol use and family indicators as reported by fathers and partners, we summarized the direction of change across these variables.

3.1.8.3 Group-level Effects

Group data were aggregated across all outcome indicators for each reporter. Wilcoxon signed rank tests and effect sizes (*r*) were calculated for all outcomes. Effect sizes (*r)* were calculated by dividing the resulting z-score by the square root of the number of observations (Field, Miles, Field, 2012). Effect sizes (*r)* are interpreted as follows: 0.10, small; 0.30, medium; 0.50, large; 0.70 very large (Cohen, 1988).

3.1.8.4 Qualitative Data

We conducted a thematic content analysis of post-treatment interview transcripts, including deductive codes based on alcohol use and family functioning literature. Themes were operationalized into a codebook. Two team members independently applied the codebook until 80% interrater reliabiltiy was acheived in interpretation of codes. All transcripts were coded, and thematic summaries were developed by code to synthesize main themes.

3.1.9 Ethical Review

The study protocol was reviewed and approved by the Duke University Institutional Review Board and the Institutional Research & Ethics Committee at Moi University (Kenya).

3.2 Results

3.2.1 Participant and Family Characteristics

Demographic information is summarized in Table 3. The total sample consisted of nine men and their respective family members. Eight of the nine men completed treatment. The average AUDIT score at enrollment was 16, which falls in the Harmful range. The mean age of fathers was 38 years (Range: 30-48), and all participants were married with the exception of one individual who was divorced and living with another partner (317); his child did not participate in assessment. Ages of the selected target children ranged from 8 to 15 years of age (mean=11). The sample reported a median monthly household income of 1500 Kenyan Shillings, about $14.84 USD.

3.2.2 Alcohol Use Changes

3.2.2.1 Mixed-effects Hurdle Model Results

Table 5 presents results of the fitted mixed-effects hurdle model. The hurdle model was an appropriate fit for examining the effect of treatment on alcohol use during the intervention and during follow-up. In examining covariates in the logit model, there was a treatment effect on the odds of not drinking on any given day, i.e., the presence or absence of drinking, during treatment and follow-up periods. During treatment, participants were 4.18 times more likely to *not* drink on any given day when compared to the baseline period. After treatment, participants were 5.10 times more likely to not drink when compared to the baseline period. When examining covariates in the count model examining amount consumed, there was a significant effect of treatment on the amount of alcohol consumed on drinking days during the intervention and follow-up. During the intervention period, on the days individuals did drink, they drank 81% less than on those occasions they drank prior to treatment. After treatment, on the days individuals did drink, they drank 50% less compared with times they drank prior to treatment. In sum, the model results show that during and after treatment, participants were more likely to have non-drinking days and that even on days that they did drink, they consumed less alcohol.

Table 5: Alcohol Changes During and After Treatment: Mixed-Effect Hurdle Model

Odds of NOT Drinking Alcohol on A Given Day (yes/no) Logit Submodel				
	OR[a]	**B**	**p-value**	**SE**
Intercept (Baseline)	0.73	-0.31	0.02	0.14
Treatment	4.18	1.43	<0.01	0.21
Follow-up	5.10	1.63	<0.01	0.22

Volume of mL Ethanol Consumed on Days Drinking Negative Binomial Submodel				
	RR[a]	**B**	**p-value**	**SE**
Intercept (Baseline)	73.70	4.31	<0.01	0.15
Treatment	0.81	-0.21	0.04	0.10
Follow-up	0.50	-0.69	<0.01	0.13

Notes. OR= Odds ratio; RR=Rate ratio; B= coefficient on linear-predictor scale (i.e., log of outcome); a=RR's are unit-specific (or conditional) estimated, as opposed to population-average

3.2.2.2 Individual Change Patterns

To begin to probe change patterns at the individual case-level, we first plotted mL ethanol consumed for each treatment completer over time within each time period (i.e., baseline, intervention, post; see Figure 7). Table 6 then presents participant's average amount of mL ethanol consumed per day as measured by the TLFB, proportion of days the participant did not drink, and the average amount spent per day on alcohol prior to the intervention and after the intervention.

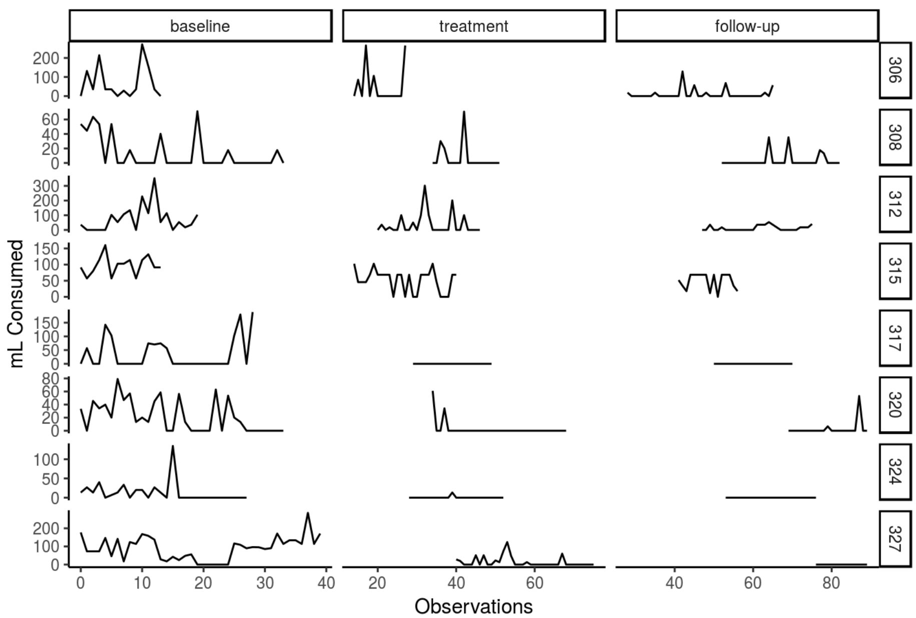


Figure 7: Treatment Completing Participants' Milliliters of Ethanol Consumed Across Time Periods

Prior to treatment the average volume of ethanol consumed was 46.54 mL (SD=34.10). The fathers with the highest levels of consumption at baseline were 315, 312, and 327, while the three with the lowest were 308, 324, and 320. All men reduced the amount of alcohol they consumed during the intervention with the exception of two individuals (306, 322), one of whom did not complete treatment (322). For those that completed treatment, the percent decrease during the intervention period ranged from 52.58% to 100%. This is depicted in the plot in Figure 7, showing that for majority of participants the level of mL ethanol consumed decreases. During the post-intervention time period, all reported reductions, with group mean consumption of 11.58 mL (SD=18.47). Percentage decreases ranged from 27.29% (322) for the individual case who did not complete treatment to 100% (317, 324, 327).

In the time period prior to treatment (mean of 32 days), participants had an average proportion of days abstinent of .34, or 34%. All participants reported increases in the proportion of days not drinking during the intervention except 322 (non-completer); they reported a group average of 72% days abstinent with a range of 28% (322) to 100% (317). During the follow-up period (mean of 23.67 days), all participants reported increases in days abstinent compared to baseline, reporting a group average of 76.78% (Range = 20%-100%). Three individuals (317, 324, 327) reported they spent no days drinking during the time after treatment (mean days=23.67). Figure 8 depicts these data graphically slightly differently by showing days on which the men *were* drinking. Compared with baseline values, all treatment completers show a pattern of reduction in days drinking during intervention and follow-up. However, this shows that three men

(312, 315, 320) did report a slight increase in days drinking after the intervention was over; though levels were still lower than at baseline. Others showed further reductions during follow-up. All but one father (315) reported drinking less than 50% of days during the intervention and follow-up period; this father reported drinking every day at baseline and continued a pattern of a high drinking days despite some reduction. With the exception of father 315, all fathers drinking fell within the threshold for Low Risk Drinking as defined by the National Institute of Alcohol Abuse and Alcoholism— about 2 standard drinks per day (~ 34.4 mL; NIAA, 2003).

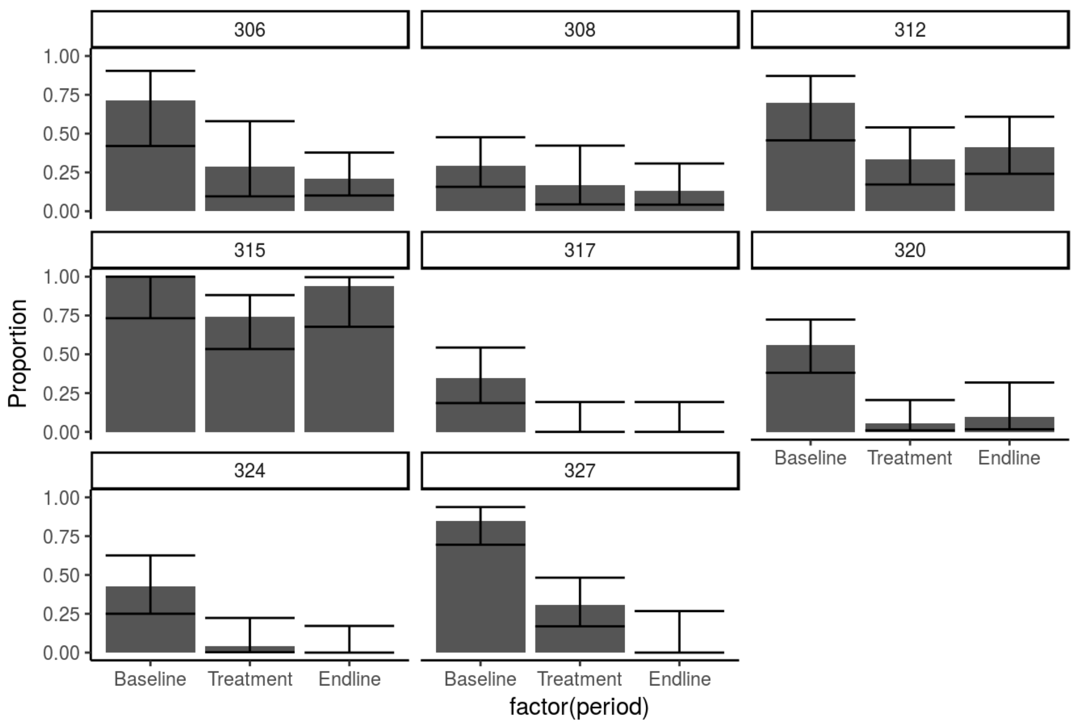


Figure 8: Treatment Completing Participants' Proportion of Days Drinking by Time Period

Additionally, all fathers who completed treatment reported spending less money on alcohol after treatment. Among treatment completers, the average amount spent per day on alcohol was $1.00 USD compared to 0.37¢ USD during the follow-up period. This is an average of 0.63 cents per day “saved” by spending less on alcohol, which comes to $18.90 dollars “saved” per month. For reference, the median monthly income for the sample was $$14.84 (0.49 cent per day).

Table 6: Father Report of Alcohol Consumption, Days Drinking, and Amount Spent on Alcohol

	Mean milliliters ethanol consumed per day					Proportion of Days NOT drinking			Amount spent on alcohol: Total and by day (USD)		
	Pre	**Intervention**	**% change**	**Post**	**% change**	**Pre**	**Intervention**	**Post**	**Pre: Day**	**Post: Day**	**Total Difference**
306	56.70	58.30	+3.00	11.16	-80.32	0.24	0.69	0.71	1.47	0.60	-0.87
315	113.96	55.18	-52.58	57.51	-49.53	0.00	0.28	0.20	1.69	1.11	-0.58
308	11.16	3.19	-71.41	2.21	-80.20	0.71	0.91	0.91	0.30	0.08	-0.22
312	75.92	32.00	-57.85	11.84	-84.40	0.29	0.67	0.59	2.50	1.07	-1.43
317	40.38	0.00	-100.00	0.00	-100.00	0.63	1.00	1.00	0.61	0.00	-0.61
320	21.88	2.46	-86.24	2.72	-88.76	0.27	0.93	0.90	0.28	0.18	-0.10
322[a]	25.80	33.92	+31.47	18.76	-27.29	0.62	0.38	0.60	0.10	0.28	+0.18
324	11.42	0.19	-98.33	0.00	-100.00	0.21	0.97	1.00	0.15	0.00	-0.15
327	61.61	13.46	-78.50	0.00	-100.00	0.10	0.64	1.00	1.92	0.00	-1.92

Notes. a=322 did not complete treatment; mL=milliliters

3.2.3 Father's Drinking- and Family-related Behavior: Individual and Group-level Change

In the sections below, we present individual-level change patterns with a focus on pre- and post-intervention scores, as well as group-level treatment effects among treatment completers. Table 7 provides descriptive data on these variables for individual families, and group-level comparison results reported on by male caregivers, female caregivers, and children are presented in Table 8, Table 9, and Table 10 respectively.

3.2.3.1 Drinking- and Family-related Problem Behavior and Conflict

Results suggest reductions in male caregivers' drinking- and family-related problem behaviors. Across all cases, at least two family members reported improvements. In six of the nine families, all assessed family members indicated improvements (306, 308, 315, 320, 317, 324). For two families, two members reported improvement and one indicated worsening (322, 312). The remaining family, 327, only had one reporter at each time point, and both reported improvements.

At the group-level, there were significant reductions in drinking and family-related problems caused by the male caregiver across all reporters, with large to very large effect sizes. Children reported the largest improvement (r =0.64), followed by male caregivers (r =0.61), and then female caregivers (r =0.59).

3.2.3.2 Missed Family Time

Father's missed family time due to drinking (i.e., meals, planned activities) improved for six of the eight families according to at least one reporter. (Data was incomplete for family 306.) In two families (312, 317), changes were seen in the unexpected direction with fathers missing more family time at post-intervention. As shown in Table 7, there were multiple inconsistencies across reporters on this 2-item measure also reflected in the group-level findings.

At the group level, there were significant reductions in missed time with family as reported by fathers (r =0.51) and children (r =1.01) with large to very large effects. There was no significant improvement in missed time as reported by female caregivers, but mean scores trended in the expected direction with a small effect size (r =0.21). Notably, internal consistency was very low for female caregivers on this scale, and they reported surprisingly low levels of missed family time at baseline. Average baseline scores across reporters ranged from 1.08 (female caregiver), corresponding to missing family time "Less than a month," and to 1.75 (child), corresponding to responses closer to "2-4 times a month," and 1.5 for male caregivers. At endline, average scores were 0.81 for female caregivers, 0 among children, and 0.50 among male caregivers.

3.2.3.3 Paternal Involvement

Five of eight families with pre-post data reported increases in father involvement across all reporters (308, 320, 315, 317, 324). For two families, two of three family members indicated increases with one reporter showing decreases (322, 312)—the female caregiver in family 312 and the child in family 322 (non-completer). For family 327, the mother reported less involvement at endline compared to the father's baseline.

At the group-level, fathers reported significant increases in their parental involvement after treatment with a large to very large effect (r=0.67). Children also reported improvements (r=0.67) that approached significance (p=0.07), and female caregivers reported smaller improvements (r=0.39) that were not statistically significant.

Table 7: Father7 s Alcohol'   Related Problem Behavior and Family Engagement: All Reporters

Family	**MISSED FAMILY TIME [0-4;** higher worse]						**DRINKING- & FAMILY-RELATED PROBLEM BEHAVIOR [0-4;** higher worse]						**PATERNAL INVOLVEMENT [0-4;** higher better]					
	MCG		FCG		Child		MCG		FCG		Child		MCG		FCG		Child	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
306[a]	--	1.00	--	--	--	1.00	1.17	1.00	1.34	0.97	2.07	1.73	--	2.30	--	2.60	--	2.70
308	1.50	0.00	0.50	0.00	1.50	0.00	1.50	0.08	1.83	0.00	2.70	0.14	2.90	2.90	2.00	2.50	0.40	2.40
312	1.5	2.00	1.00	2.00	1.50	--	2.00	1.46	2.14	2.17	2.29	0.00	1.50	2.60	1.80	1.30	1.40	1.50
315[a]	2.00	0.00	0.00	0.00	2.00	0.00	1.09	0.75	1.93	0.80	1.36	0.64	--	3.90	1.80	3.00	2.00	2.40
317	--	--	1.00	1.50	--	--	1.72	0.00	2.28	1.97	--	--	1.60	2.20	1.20	1.60	--	--
320	1.50	0.00	0.50	0.00	1.50	--	1.64	0.13	1.14	0.00	1.07	0.00	1.80	2.50	2.00	2.40	1.40	3.00
322[b]	2.00	0.00	1.50	0.50	0.00	0.50	1.52	0.21	1.14	0.69	0.07	1.14	2.40	2.80	1.60	2.50	2.50	1.70
324	1.00	0.00	3.00	2.00	4.00	--	0.72	0.00	2.45	0.96	2.77	--	2.40	2.50	2.00	2.00	0.80	--
327[c]	3.00	--	--	0.50*	1.50	--	3.00	--	--	1.21	2.79	--	2.60	--	--	1.60	0.20	--

Notes. a=Only received 4 sessions and only pre post outcomes were examines; b=did not complete treatment; c= for 327, male caregiver baseline scores were compared with female caregiver end line scores; MCG= male caregiver; FCG= female caregiver

3.2.4 Secondary Outcomes: Group-level Pre-Post Changes

For male caregivers, Table 8 displays Wilcoxon signed-rank test results and effect size calculations for all pre-post secondary outcomes described below. Table 9 and Table 10 present these results for female caregivers and children respectively.

3.2.4.1 Family Outcomes

Mean scores on overall family functioning suggested improvement across all reporters, though no differences reached statistical significance at an alpha level of .05. The child-reported effect was large (r=0.62) and approached significance, followed by male caregivers' report (r=0.45) that also approached significance. The treatment effect reported by female caregivers was small (r=0.25) and non-significant. No significant changes were observed for household decision-making, though examination of means suggest slight change in the expected direction, as higher scores indicated joint planning.

3.2.4.2 Couple and Father-Child Relationship Outcomes

At the couple-level, relationship quality significantly improved across male and female caregiver reporters with large to very large effect sizes. Harsh marital treatment did not show significant change across reporters; men's means moved in the expected direction but women's did not. For the father-child relationship, relationship quality significantly improved according to all reporters, with medium effect sizes, though only female caregiver and child-reported effects reached statistical significance at $p<0.05$.

Children also reported a large treatment effect on reductions in harsh discipline that approached statistical significance, though caregivers did not report changes in this domain.

3.2.4.3 Individual Mental Health

Among caregivers, individual mental health improved significantly after fathers received treatment. The treatment effects were large for both male caregiver mental health (r =0.61) and female caregiver mental health (r =0.62). Child mental health improved significantly based on caregivers' reports showing a medium-sized effect, though children reported a small treatment effect that was non-significant.

3.2.4.4 Male Caregiver Indicators of Treatment Motivation

All scores on indicators of treatment motivation and engagement moved in the expected direction, suggesting improvement from pre to post test, though most were not statistically significant. Fathers' readiness to take steps to make changes, as measured by a subscale of the SOCRATES, showed significant improvement with a large effect size (r=0.61; $p < 0.01$). Readiness to change, confidence in change, and willingness to engage in subsequent psychological treatment all changed in the expected direction with medium effect sizes but were non-significant at an alpha level of .05. It should be noted these scores were high at baseline with relatively little room to change.

Table 8: Group-level Primary and Secondary Outcomes: Male Caregiver Report [Treatment Completers]

Measurement (valence of higher scores)	**Pre**	**Post**	**Wilcoxon z**	**ES (*r*)**
PRIMARY OUTCOMES				
Alcohol Use: mL Ethanol (-)	46.87	12.17	-2.67**	0.63
Alcohol Use: % days drinking (-)	0.63	0.23	-2.55**	0.60
Missed Family Time (-)	1.50	0.50	-1.76**	0.51
Drinking-related problem behavior: Family (-)	1.49	0.54	-2.29**	0.61
Father parental involvement (+)	2.04	2.70	1.91**	0.67
SECONDARY OUTCOMES				
Family Functioning (-)	3.82	2.92	-1.70*	0.45
Household Decision Making (+)	4.86	5.43	1.41	0.38
Couple				
Relationship Quality (-)	1.91	1.00	-2.37**	0.63
Harsh Treatment (-)	0.35	0.06	-1.10	0.29
Child				
Relationship Quality (+)	3.35	3.70	2.10*	0.50
Harsh Discipline (-)	0.33	0.26	0.00	0.00
Individual				
Masculine Role Beliefs (+)	6.86	8.70	0.95	0.25
Mental Health (PHQ-9; -)	7.00	1.43	-2.30**	0.61
Child Mental Health (-)	0.50	0.09	-2.37**	0.59
INDICATORS OF TREATMENT MOTIVATION				
Taking Steps (+; total score)	25.71	29.75	2.29**	0.61
Readiness to Change (+)	7.78	9.125	1.72	0.46
Confidence in Change (+)	8.33	9.25	0.76	0.38
Willingness to Engage in Treatment (+)	7.88	9.88	1.72*	0.43

Notes. ES= effect size; **= p<0.05; *=p<0.10

Table 9: Group-level Primary and Secondary Treatment Outcomes: Female Caregiver Report [Treatment Completers]

Measurement (valence of higher scores)	**Pre**	**Post**	**Wilcoxon z**	**ES (*r*)**
PRIMARY OUTCOMES				
Alcohol Use: MCG % days drunk (-)	0.54	0.34	-2.37**	0.63
Missed Family Time (-)	1.08	0.81	-0.77	0.21
Drinking-related problem behavior: Family (-)	1.87	0.98	-2.20**	0.59
Father parental involvement (+)	1.81	2.20	1.16	0.39

SECONDARY OUTCOMES				
Family Functioning (-)	4.01	3.30	-0.98	0.25
Household Decision Making (+)	3.90	4.00	0.08	0.02
Couple				
Relationship Quality (-)	2.51	1.44	-2.37**	0.63
Harsh Treatment (-)	0.45	0.51	0.71	0.19
Father-Child				
Relationship Quality (+)	2.77	3.35	2.03**	0.54
Harsh Treatment (1 item)	0.24	0.24	--[a]	--
Individual				
Mental Health: Self (PHQ-9; -)	7.29	1.90	-2.31**	0.62
Child Mental Health (scale score; -)	4.12	1.43	-1.96**	0.53
INDICATORS OF TREATMENT MOTIVATION				
MCG Willingness to Engage in Treatment (+)	7.00	9.71	1.70*	0.45

Notes. ES= effect size; **= p<0.05; *=p<0.10; MCG= male caregiver; a=All pairwise differences = 0, so unable to complete test

Table 10: Group-level Primary and Secondary Treatment Outcomes: Child Report [Treatment Completers]

Measurement (valence of higher scores)	**Pre**	**Post**	**Wilcoxon z**	**ES**
PRIMARY OUTCOMES				
Missed Family Time (-)	1.75	0.00	-2.02**	1.01
Drinking-related problem behavior: Family (-)	1.90	0.50	-2.02**	0.64
Father parental involvement (+)	1.30	2.40	1.83*	0.65
SECONDARY OUTCOMES				
Family Functioning (-)	4.54	1.97	-1.76*	0.62
Household Decision Making (+)	3.2	5.6	1.70*	0.60
Parent-Child				
Relationship Quality (+)	2.58	3.60	2.02**	0.76
Harsh Treatment (-)	0.68	0.23	-1.91*	0.67
Individual				
Child Mental Health (-)	3.80	2.6	-0.96	0.34

Notes. ES= effect size; **= p<0.05; *=p<0.10

3.2.4.5 Co-occurring Changes

To examine the extent to which changes tended to co-occur in families, as reported by both caregivers, we summarized changes across domains for each case in Table 11. Five of eight families with complete data had almost uniformly positive changes across domains, with over 87% of indicators moving in the positive direction. That is, most families experienced co-occurring changes in fathers' drinking and family relationships. The other three families (312, 315, 322) also showed improvements on the majority of indicators but less consistent patterns. For 312, discrepant reporting emerged with the female caregiver reporting more problems at post test across some family-related outcomes. In the case of family 315, reports also disagreed, with the male caregiver reporting no change in drinking- and family-related problem behaviors and harsh discipline, and increases in the couple's harsh treatment. Lastly, for family 322 in which the male caregiver did not complete treatment, the father reported increases in days drinking, and the female caregiver indicated harsh marital treatment and harsh child discipline changed in the unexpected direction.

Table 11: Co-occurring Change Across Key Indicators from Caregiver Reporters

	Primary Outcomes				**Couple Relationship**				**Father-Child Relationship**						**Mental Health**			
	% Days Drinking		Alcohol-driven Family Conflict		Couple RQ		IPV		Father-Child RQ		Harsh Discipline		Father Involvement		MCG Mental Health	FCG Mental Health	Child Mental Health	% Positive Change Indicators
ID	MCG	FCG	MCG	FCG	MCG	FCG	MCG	FCG	MCG	FCG	MCG	FCG	MCG	FCG	MCG	FCG	Child	
306	✓	--	✓	✓	✓	✓	✓	No **Δ**	✓	---	**X**	--	--	--	✓	✓	✓	92%
308	✓	✓	✓	✓	✓	✓	0	0	No **Δ** [a]	✓	✓	✓	✓	No **Δ**	✓	✓	✓	87%
312	✓	✓	✓	**X**	✓	✓	✓	**X**	✓	**X**	✓	✓	✓	**X**	✓	No **Δ**	**X**	65%
315	✓	✓	No **Δ**	✓	✓	✓	X	✓	✓	✓	No **Δ**	**X**	Na	✓	0	✓	No **Δ**	69%
317	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**X**	✓	✓	✓	✓	✓	---	94%
320	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	----	✓	✓	✓	✓	✓	✓	94%
322	**X**	✓	✓	✓	✓	✓	0	---	✓	✓	**X**	✓	✓	✓	✓	✓	X	75%
324	✓	na	✓	✓	✓	✓	✓	---	✓	✓	✓	✓	✓	No **Δ**	✓	✓	---	87%
327[a]	✓	Na	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---	---

Notes. ✓= indicates change in the expected direction; X = indicates change in the unexpected direction ; No **Δ** = No Change; 0 reported at endline and baseline; a= 3.84 to start on a 4 point scale; RQ= Relationship quality; MCG= male caregiver report; FCG= female caregiver report; b= for 327 female caregiver completed post assessment and not pre and male caregiver completed pre and not post.

3.2.5 Qualitative Descriptions of Change

Qualitative findings supported quantitative results. Prior to therapy, most female caregivers and children reported men were drinking alcohol, often causing chaos in the home, "devouring" finances on alcohol, and were inattentive and neglectful of family issues. After the intervention, female caregivers noted reductions in alcohol use and improvements in family functioning. Family level changes included improvements in family "peace," increased attention to family issues, and reductions in "chaos." Most female caregivers also reported improvements in the couple relationship, noting that now their partners "sit and talk" with them.

All female caregivers reported abstinence or reductions in alcohol use that were often described alongside reports of fathers' increased family-directed behavior. For partners who reported their husbands' drinking decreased but did not stop, they described positive changes in men's behaviors even during drinking events. These included informing their partner they were going to drink, ensuring basic household needs were met, increased receptivity to wives' questions and to requests to come home early, as well as apologizing to family members, asking questions to family members, and remaining calm and "maintaining peace" after drinking. To this theme, one child remarked, "He can go then come back in the evening and apologize saying 'I have drunk a little amount of alcohol,' so there is no conflict therefore we can sleep peacefully, and we all wake up safely and go on with our endeavors for the day."

In addition to improvements in family relationships, partners reported fathers increased their financial provision. One partner reported her husband began working, and two reported their children were able to enroll in school because of the father's increased efforts to provide and share money. One partner remarked, "I see the money he earned, unlike before where I never saw any money he earned." Partners tied increased financial provision directly to the intervention, reductions in drinking, or increased commitment to family. One partner explained this change was due to the father "realizing his responsibilities as a father in the house;" further noting, "now as we are talking…there are no conflicts, he comes home on time...watching his kids, we can even do work together." Partners and children reported recognizing and appreciating this effort. Related, some partners and children reported increased feelings of safety, reduced worry, increased happiness, and improved trust due to fathers' efforts to both reduce drinking and fulfill family responsibilities.

Improvements in the father- child relationship were also described including increased openness and reduced fear. Some women also reported increased trust in their partners' caregiving abilities. As one mother reported, "Now when my children see their father is sober, they are happy making them to have a good relationship... he can spend time with them. Even if I leave for works somewhere, I leave them with him, and when I return I find them just fine."

Three women reported intimate partner violence at baseline, and all reported reductions in physical abuse and harsh verbal treatment after the intervention. One child reported, “They [his parents] used to chase after each other, father would even throw stones at her, but now it is better, and there is peace in the house.” Two female caregivers reported increased freedom and respect within, and outside of, the household, with one woman describing the following increased economic autonomy:

> Nowadays he lets me go and look for a job unlike before where if I left to look for a job and return, it was chaos, violence and abusing me, saying that I had gone to do prostitution and many other things. There was no sleeping in peace, he [would] chase [me] at night because of the job I went to do, saying that I acquired money the wrong way … but nowadays if I tell him I want to go and look for a job to do, he tells me to go.

Some men attributed these changes to reduced jealousy and improved trust and emotional security in their relationships with their wives.

Regarding individual health and mental health, two women noted that their “psychological hurt” reduced due to husband changes. Some children reported increased happiness and hope. Lastly, all fathers reported emotional and interpersonal improvements, such as increased hope and improved harmony with others, as well as perceived acceptance by others in the community. One father specifically noted others have begun offering him more jobs in the community.

Participants also described specific change pathways. Results suggested that prior to treatment, spending on alcohol use was tied to couple mistrust, conflict and violence, then increased father drinking/spending, which left no money for basic needs and school fees. After treatment, some families described a new pathway in which the fathers' would get money, plan with the wife or share money with the family, and then act less defensively when asked about money, which led to fewer fights, and, for a few, more money for school fees, clothes, food, and activities. A female caregiver from one family described changes in her husband's drinking, communication, provision efforts, and attitude shifts saying:

> It is because he has ceased from most of his mischievous behaviors. He has reduced his alcohol intake, and when he wants to drink he alerts me that he will drink, but just a little. Then I would in return ask him if he has any money, and he would say yes. Then I would ask him to buy for us food before he goes his way, and he would do that. I would also request him to come back earlier, and he would…So in general I can say that he is now responding to my opinion unlike before. He would utter words like, 'We the Nandi people don't allow women to have any say.' He has become very hospitable.

3.3 Discussion

Results suggest that an integrated MI and BA treatment for fathers engaging in problem drinking may be helpful for reducing men's alcohol use— both in terms of the number of days on which they drink and the amount of alcohol they consume when drinking. In addition, results suggest this treatment may improve family-level outcomes, including fathers' problematic drinking behavior affecting the family and parental involvement. Effect sizes for these primary outcomes ranged from large to very large across reporters, with the exception of a medium-sized effect on female caregiver reports of father parental involvement. Significant positive clinical changes were also seen in secondary outcomes less directly targeted in the intervention, including father-child relationship quality, couple relationship quality, individual mental health for both male and female caregivers, and caregiver-reported child mental health. Other secondary outcomes, including general family functioning, harsh treatment towards children and between partners, and household decision making also changed in the expected direction; some effect sizes were large in magnitude despite not reaching statistical significance. Qualitative data further supported that the changes experienced by fathers and families were meaningful across domains. This study builds on evidence supporting the use of interventions to reduce alcohol use in in LMICs by examining a BA intervention with integrated MI and GTS that targets both alcohol use and family-related outcomes in a community setting.

Improvements in alcohol use were especially encouraging. During the time after treatment, participants were 5.1 times more likely to not drink any alcohol on a given day as compared to days drinking during baseline. On occasions participants did drink after the intervention, they drank 50% less than the amount they consumed during the baseline period. At the individual case-level, results were also promising. Of the eight treatment completers, three were abstinent, four fell in the range of Low Risk Drinking (NIAAA, 2003), and one reduced amount consumed by 50%. Female caregiver reports of fathers' percent days drinking supported these results. In addition, qualitative findings from all family members further suggested reductions in use were clinically significant.

Results help expand evidence for the use of BA to treat substance use to LMICs and community settings. This builds on Daughters and colleagues (2008) work demonstrating the effectiveness of a BA treatment for improving depression and reward value of non-drug activities with illicit drug users, and later demonstrating improved abstinence rates among substance dependent users in 30-day residential treatment (Daughters et al., 2017). Findings also add to the growing literature in LMICs demonstrating the effectiveness of treatments with MI for reducing alcohol use when delivered by lay providers (Patel et al., 2017; Sorsdahl et al., 2015; Nadkarni et al., 2017). Although primary outcome measures differed across studies, effects of alcohol reduction in this study were comparable to large trials in LMICs of brief blended MI plus problem solving therapy (PTS), motivational enhancement-based therapy, and an 8-session CBT trial (Sorsdahl et al., 2015; Nadkarni et al., 2017; Papas et al., 2011). Further, the average percentage of days abstinent post-treatment (76.8%) in our study is consistent with rates (69.4%) seen in the trial examining a 4-session, lay provider-delivered motivational enhancement based treatment in a primary care setting in India (Nadkarni et al., 2017).

Changes in family outcomes were also promising, as one of the central questions was whether a brief intervention with just fathers was able to address multiple family outcomes impacted by alcohol use. The agreement in findings across multiple reporters further strengthens the validity of these findings. Reductions in drinking- and family-related problem behavior in the context of alcohol use, such as the number of times the male caregiver failed to do what was expected of him because of drinking or quarreled with his wife or child when he was drunk, suggest direct changes at the family-level that may have unfolded in part due to reductions in alcohol. Positive family-level findings such as improved family time, parental involvement, and relationship quality, further suggest the intervention may be helpful for targeting men's behavior toward, and interaction with, their families.

Results on family outcomes align with evidence from HICs for programs that target the intersection of alcohol use and family interactions with comparable effects on couple relationship quality and alcohol consumption (Power et al., 2008). This program differs from many treatments in HICs, though, which are longer and typically involve the spouse or partner of the identified patient (O'Farrell, & Clements, 2012). Our preliminary findings suggest that the inclusion of a family member may not always be necessary for seeing changes at the family-level. For families with very high levels of conflict, however, the inclusion of other family members in treatment may be a key aspect for seeing improvements (Stover, Meadows, & Kaufman, 2009). Related, the use of this intervention as an adjunct treatment to other family or parenting interventions may be a fruitful avenue to address more severe family concerns and/or to promote child well-being more directly. This intervention holds promise for preparing, motivating, and possibly engaging fathers in subsequent interventions, in part by reducing the participation barrier of alcohol use and building motivation to engage with family. Exploring this treatment in such a capacity could fill a critical gap in family research given fathers are notably absent from many parenting and family-based programs due in part to difficulties engaging men (Mejia et al., 2011; Knerr & Gardner, 2013; Barry, Clarke, Jenkins, & Patel, 2013; Panter-Brick et al., 2014). Some have asserted that successfully engaging fathers in family treatments could be a "game change" for improving positive, equitable outcomes among all family members, particularly in settings where men may hold more culturally-afforded decision-making power (Panter-Brick et al., 2014; Neger & Prinz, 2015; Jewkes et al., 2015).

In addition to improvements in family outcomes, individual mental health demonstrated positive change. For men, reduction in PHQ-9 scores showed a large to very large effect size. Although symptoms of depression were not directly targeted, BA was chosen in part to address fathers' feelings of purposelessness and hopelessness stemming from a lack of economic opportunities (Dworkin et al., 2012; Puffer et al., 2018). Results add to the robust evidence for the effectiveness of BA treatment on depression in HICs and LMICs (Patel et al., 2017; Cuijpers, P., Van Straten, A., & Warmerdam, 2007) with comparable effect sizes to previous trial of BA with substance using populations (Daughters et al., 2008).

Further, reductions in depression symptoms considered alongside changes in drinking suggest BA may be targeting an underlying vulnerability shared by both problems. This shared vulnerability might be that these men experience lower rates of positive reinforcement of healthy, valued behaviors that contribute to substance use and the onset and/or maintenance of depressive symptoms (Lewinsohn, 1974; Vuchinich & Tucker, 1988; Daughters et al., 2016). As such, seeing changes in both depressive symptoms and alcohol use lends support to the idea that the intervention may be targeting these underlying processes—working in part by increasing positive reinforcement of new activities. Targeting positive reinforcement through BA strategies may be a parsimonious and cross-cutting approach for targeting multiple outcomes and has been suggested for use as such (Hopko, Lejuez, & Hopko, 2004). This may be especially helpful for use in diverse, low-resources settings given these strategies are also straightforward and can be contextualized.

In addition to positive reinforcement, other potential drivers of change should be explored further. In this treatment, it is possible that MI strategies increased motivation for change and facilitated reductions. This hypothesis is supported by the observed increase in fathers' desire to take steps to change (Taking Steps), which has been shown to mediate substance use outcomes in an MI blended PST therapy in South Africa (Myers et al., 2016). In likelihood, some combination of motivational factors and reinforcement of new behavioral patterns through scheduled activities might be at play (Magidson, Robustelli, Seitz-Brown, & Whisman, 2017).

Two more context-specific pathways to examine in future studies relate to shifts in fathers' role saliency and financial provision. First, we speculate that fathers' increased commitment and openness with the family may result from the values identification component of the intervention, coupled with the new behavioral patterns; together, these might increase the saliency and importance of the male caregiver role within the family (to the father), improve self-efficacy, and provide tools to reach goals. This in turn may lead to improved interactions with women and children in the home beyond those targeted by activity scheduling. A qualitative study examining a parenting intervention in Liberia showed change through a similar pathway; caregivers' increased sense of nurturing as part of their parental roles seemed to drive motivation to engage in a suite of positive parenting behaviors compatible with this identity (Giusto et al., 2017).

Second, reductions in money spent on alcohol and qualitative findings describing increased financial provision at home may be an important mechanistic component for seeing positive family outcomes. While these preliminary results are promising, a better understanding of how interventions may change income generation and distribution within families in low-resource contexts is important. To more directly target this outcome, next steps could include pairing an intervention like this with livelihood-related programming. Such an addition would be consistent with literature suggesting economic disenfranchisement may be an important component to address in interventions that attempt to broaden conceptions of masculinity (Gibbs et al., 2015).

While the majority of individuals showed positive patterns of change, one advantage of the small sample, single case series design is the importance of looking at individual case patterns of change. Two fathers (312, 315) who completed treatment and their families showed fewer quantitative changes across outcomes and reporters. Both these fathers reported the highest levels of alcohol use at baseline, which has been shown to mitigate some treatment effects of MI (Vasilaki, Hosier, & Cox, 2006). Additionally, both fathers reported relatively low readiness and confidence to change scores at baseline in comparison to other participants. As such, these men might have needed more emphasis in initial sessions on building motivation, readiness, and commitment to change than is included in this intervention. At the family-level, no clear patterns emerged that might clarify results. Interestingly, although the female caregiver in 312 reported quantitative changes in the unexpected direction for couple and child harsh treatment and reduced father involvement, her qualitative interview described marked reductions in father violence, controlling behavior, and child neglect. This suggests that her baseline score may have been an underestimate of initial issues, or qualitative changes were not captured well by the employed measures in this case.

While results from this small-scale pilot offer promising preliminary support of the intervention, the study is not without limitations. While a single-case series design is appropriate for examining the initial impact of a new treatment and much stronger design that common pre-post-test designs (Barlow, Andrasik, & Hersen, 2007; Kazdin, 2011), the use of a small sample limits generalizability of findings and calls for some level of caution in interpreting statistical inferences. Additionally, while this design controls for the passage of time, it does not account for other factors that may have accounted for change. Further, biometric measures of alcohol use may have strengthened conclusion and reduced social desirability bias, though the use of multiple reporters was included to augment self report. Further, post-intervention assessment points limit the ability to detect long-term treatment outcomes beyond one month. Next, the number of observations during each time period varied somewhat across participants, which might influence the comparison of behaviors between cases.

4. Conclusion

Despite these limitations, results set the stage for larger trials to test treatment efficacy and potential mechanisms of action. One upcoming priority is to examine the intervention theory of change. To this end, we plan to examine additional repeated measures not reported here, as well as clinical process and conceptualization data from session transcripts to analyze the unfolding of change within, and then across, cases (Hillard, 1993). A more nuanced understanding of what drives change can impact future iterations of the program based on the strongest, most essential ingredients.

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Biography

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