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Evaluation of Alcohol Screening and Community-Based Brief Interventions in Rural Western Kenya: A Quasi-Experimental Study

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Abstract

Aims: To assess the effectiveness of community-based alcohol brief interventions (ABI) implemented by community-health workers with and without motivational talks (MT) by former drinkers, in reducing harmful and hazardous alcohol consumption.

Methods: We conducted a three-arm quasi-experimental study (one control and two intervention groups) between May and December 2015 in Kakamega County, Kenya. Participants were hazardous or harmful alcohol drinkers with an Alcohol Use Disorders Identification Test (AUDIT) score of 8–19 at baseline. One intervention group received only ABI while the other received ABI + MT. The interventions' effects on AUDIT scores were analysed using linear mixed models. Logistic regression was used to analyse the interventions' effects on low-risk drinking (AUDIT score <8) after 6 months.

Results: The study included 161 participants: 52 in the control group, 52 in the only ABI group and 57 in the ABI + MT group. The mean AUDIT scores were lower in the intervention groups at 1, 3 and 6 months post-intervention; the ABI + MT group showed a greater reduction. The mean AUDIT scores over a 6-month period were lower in both intervention groups compared with the control group. The odds of low-risk drinking were almost two times higher in both intervention groups than in the control group, although the effect of only ABI on low-risk drinking was not significant.

Conclusions: ABI + MT and only ABI were associated with a reduced mean AUDIT score among hazardous and high-risk drinkers in this resource-limited setting. ABI + MT was also associated with low-risk drinking in this population.

Short summary: Community-based alcohol brief interventions implemented by community-health workers accompanied by motivational talks by former drinkers were associated with reduced hazardous and harmful alcohol consumption in a rural setting in western Kenya.

INTRODUCTION

Harmful alcohol consumption is a major public health problem worldwide, as it is a cause of multiple physical and mental diseases (Rehm *et al.*, 2009; WHO, 2014). In Africa, 6.4% of all deaths and 4.7% of all disability adjusted life years (DALYs) lost in 2012 were attributable to alcohol consumption (Ferreira-Borges *et al.*, 2016). Alcohol use disorders are emerging as serious health problems in Kenya where consumption of homemade brews is common (Ferreira-Borges *et al.*, 2016). Media reports of deaths from consumption of illegal homemade alcohol in Kenya are becoming more common (Leposo, 2010; Reuters, 2014). Despite this trend, mental health is often not a priority in Kenya and, as in many developing countries, limited resources are allocated to it (Kiima and Jenkins, 2010; WHO, 2011). According to the National Authority for the Campaign Against Alcohol and Drug Abuse (NACADA), the Kenyan government plans to establish rehabilitation facilities for alcohol addiction nationwide (NACADA, 2016), but this is a mirage. In the absence of sufficient alcohol rehabilitation facilities, community-based interventions to reduce alcohol consumption using locally available human resources are needed.

Alcohol brief interventions (ABI) and the Alcohol Use Disorders Identification Test (AUDIT) were developed by the World Health Organization (WHO) in 1982 to identify hazardous or harmful alcohol consumption and provide consumers with brief counselling at first contact in primary health-care settings (WHO, 1980; Babor *et al.*, 1986, 1992; Saunders and Aasland, 1987). Several studies conducted in health facilities in high- and middle-income countries have reported the effectiveness of ABI (Kaner *et al.*, 2007; Elzerbi *et al.*, 2015; Joseph and Basu, 2017). ABI have since been modified to reach target populations in other settings through different means (Khan *et al.*, 2013; Voogt *et al.*, 2013; Dhital *et al.*, 2015; Fazzino *et al.*, 2016). The interventionists in most of these studies were professional health personnel. However, Kenya has a shortage of health facilities and health-care workers, with only 18.1 beds, 16 medical doctors, 8 pharmacists and 32 registered nurses per 100,000 persons (National Coordinating Agency for Population and Development *et al.*, 2005). The shortage of human resources in the field of psychiatry working in rural areas is even more severe, with the vast majority of psychiatrists and psychiatric nurses being based in the capital city of Nairobi (Kiima and Jenkins, 2010).

Given the shortage of professional health personnel, one solution to reducing hazardous or harmful alcohol consumption is to use a model involving community-health workers (CHWs) to implement ABI (Bhutta *et al.*, 2010). However, there is limited information on the effectiveness of such a model in low-income settings, with only one Kenyan study involving ABI (Parcesepe *et al.*, 2016). The interventions in this study were conducted in an urban setting by nurses; ABI was found to be associated with reductions in interpersonal violence and engagement in sex work among female sex workers. Motivation may influence behavioural change because of its effect on self-efficacy (Rodgers and Loitz, 2009). Thus, motivational talks (MT) by individuals who have successfully overcome alcoholism should enhance community-based ABI in reducing hazardous alcohol intake.

The primary objective of this study was to assess the effectiveness of community-based ABI delivered by CHWs with and without MT by former drinkers, in reducing AUDIT scores among harmful and hazardous alcohol consumers. The secondary objective was to assess the effect of these interventions on low-risk alcohol consumption in this population. We hypothesized that the interventions would reduce the mean AUDIT scores, and therefore, the proportion of harmful/high-risk drinkers in the study population.

MATERIALS AND METHODS

Study design

We conducted a three-arm quasi-experimental study from May to December 2015, which involved three villages in Ikolomani Sub-county, Kakamega County, Kenya. We selected the villages purposively based on their locations (at least 5 km from each other) to minimize contamination. Participants in the first intervention village received ABI implemented by trained CHWs (only ABI group) while those in the second intervention village received ABI implemented by CHWs plus MT by former drinkers (ABI + MT group). Participants in the third village acted as controls and received only general health information on alcohol consumption.

Study settings

Ikolomani sub-county consists of ~104,669 inhabitants (Kakamega, 2016), has a surface area of 143.6 km^2, and is divided into four wards with ~130 villages. Subsistence crop and livestock farming are the area's mainstay economic activities, and the Luhya people comprise the predominant ethnic group. Kakamega County is composed of a young population: 58% is less than 20 years old and 37% is 20–65 years old. The nearest drug and alcohol rehabilitation centre is located ~100 km away in the town of Eldoret in Uasin Gishu County (NACADA, 2016). According to a survey conducted in the study area (Takahashi *et al.*, 2017), the prevalence of alcohol consumption when the study was conducted was 31.7% (54.6% in men and 8.9% in women), and that of hazardous or high-risk drinking was 28.7%. Moreover, traditional brews were the most commonly consumed types of alcohol.

Sample size

The sample size was calculated based on a meta-analytic effect size of 0.3 for brief interventions among non-treatment-seeking samples (Moyer *et al.*, 2002), a power of 85%, an alpha of 0.05 for a 95% confidence interval, and between-groups degrees of freedom (or numerator degrees of freedom) of K–1, (where K is 3 study groups). The sample size was calculated, using G*Power 3.1.9.2 (Mayr *et al.*, 2007), to be 125. To account for potential loss to follow-up, the sample size was increased by 20% to yield a final sample size of 150, or at least 50 participants per group.

Participants and recruitment

Participants were adult household members aged 18–65 years, with an AUDIT score of 8–19, permanent residence in the study villages, no plans to move in the next 6 months, and a desire to participate in the study. Eligible participants were recruited through house-to-house visits. After providing written informed consent, participants were enroled until the desired sample size for each study group was achieved. The exclusion criteria were being pregnant, having a history of treatment for alcohol-related problems or a psychiatric illness, or involvement in another alcohol-related intervention. None of the recruited individuals met any of the exclusion criteria.

Training of the interventionists

We recruited two CHWs (one from each intervention village) to implement the interventions. Both CHWs, who had at least a

secondary school education, received 6 days of training. The training was based on a manual adapted from existing materials on ABI and included information about ABI, alcohol consumption and its related effects, factors to consider while implementing ABI, and the six essential elements of brief ABI as summarized by the acronym FRAMES (Feedback, Responsibility, Advice, Menu, Empathy, Self-efficacy) (Hester and Miller, 1995). The training also included classroom role-plays and a one-day field practice. CHWs are selected by village members and trained by professional health workers, based on a standard curriculum, to link the community with the formal health system through the implementation of community-based health interventions and referrals of sick community members to health facilities (Ministry of Health, 2006). The selection of this study's CHWs was made in consultation with sub-county health officers responsible for managing the community-health strategic plan. A community-health extension worker (CHEW) usually supervises the CHWs, and we retained the present structure to avoid creating new group dynamics. The CHEW was trained with the CHWs. We recruited two motivational speakers, one from among former drinkers in the ABI + MT village and another one from a neighbouring village. The motivational speakers were recommended by the CHWs and interviewed by the principal investigator to assess their suitability prior to the study's initiation. No training, apart from a brief description of the study's objectives and what they were expected to cover during the MT (see below), was provided to the speakers.

Procedures

The first intervention village received only ABI, consisting of three sessions, each lasting 5–20 min. The intervention was implemented by CHWs under the supervision of a CHEW and a nurse from the local hospital. The nurse was also responsible for the overall supervision of the interventions. The first session was conducted within a week after the AUDIT screening; the second was conducted 2 weeks after the first session; and the third was conducted 1 month after the second session (see Appendix 1 in the Additional information file). The second intervention village received ABI plus MT, which was conducted twice a week after the first and second ABI sessions. Motivational speakers covered the following content areas: (1) reasons they started to drink alcohol, (2) their life during the drinking period, (3) problems encountered during the drinking period (health, social and economic problems), (4) reasons they stopped drinking alcohol, (5) how they stopped drinking alcohol (difficulties and how they overcame them), (6) life after quitting alcohol and (7) message/encouragement for the participants. The MT sessions included time for discussion and questions for the speaker. They were held in local schools located within walking distance of the participants' homes. All the ABI were conducted on a one-to-one basis in private rooms and the MT were delivered in a group setting. Participants were compensated with a non-monetary incentive worth $2 US for each day of participation or evaluation. All participants were contacted by phone 2 days in advance to remind them about the scheduled day of the intervention or evaluation. Interventions were supervised through daily group meetings with the CHWs, in which they shared experiences and sought solutions to the challenges they encountered. Intervention fidelity was assessed by reviewing the records kept by the CHWs and the MT attendance sheets.

Data collection

Baseline data were collected on alcohol consumption (AUDIT) and socio-demographic characteristics, including age, gender, education, religion, household asset ownership, type of housing material, and access to utilities using a structured questionnaire. The AUDIT was administered during the follow-up surveys 1, 3 and 6 months after the last intervention. In these follow-up assessments, the AUDIT was modified to cover the preceding first, second and third months, respectively, to avoid overlaps in the reference periods. All the questionnaires were prepared in English and translated to Kiswahili. Baseline and follow-up data were collected through face-to-face interviews by two trained data collectors; neither was involved in the interventions.

Outcomes

The primary outcome for this study was the differences in the mean AUDIT scores between the control group and each of the intervention groups at 1, 3 and 6 months, and over the entire 6-month period post-intervention. The secondary outcome was low-risk alcohol consumption, defined as an AUDIT score <8 at 6 months post-intervention.

Statistical analysis

All statistical analyses were performed using STATA 14 (StataCorp, College Station, TX, USA). Principal components analysis was used to calculate the wealth index (tertiles) based on information about participants' ownership of household assets, type of housing material, and access to utilities (Filmer and Pritchett, 2001). Participants' baseline characteristics were summarized using descriptive statistics and differences in characteristics across groups were examined using the chi-square test for categorical variables and one-way analysis of variance for continuous variables. The proportion of participants with missing outcome data at 1, 3 and 6 months were examined and the mean AUDIT scores at these time points were computed. The data were analysed based on intention to treat. All the assessment time points were included in the analysis of data related to the primary objective. In the main analysis, only participants with complete data on the AUDIT at each follow-up assessment were included. To assess the interventions' effects on the AUDIT scores, while accounting for repeated measurements, restricted maximum likelihood linear mixed models with random effects were fitted at the individual level. The control group was used as the reference. Both an unadjusted and adjusted model for differences in the baseline covariates were tested. An interaction term was inserted between 'study group' and 'assessment time point', and the *margins* command was used to obtain mean AUDIT scores at each time point. The interactions were plotted using the *marginsplot* command. The *margins* command was also used after fitting the linear mixed models to examine the effects of the interventions over the entire follow-up period of 6 months. A *post hoc* comparison between the only ABI and ABI + MT groups was also performed.

Sensitivity analysis

Because loss to follow-up may bias the estimated effects of interventions on outcomes, a *post hoc* sensitivity analysis was performed by imputing missing AUDIT scores and repeating the analysis described above. No differences in participants' baseline characteristics with or without missing AUDIT scores were found (Appendix 2). A single imputation was performed using chained equations to create a dataset with complete data. To satisfy the 'missing at random' assumption for multiple imputations, the imputation model included all the baseline variables in Table 1 with a score on attitude towards alcohol.

Table 1. Baseline socio-demographic characteristics of the participants

Characteristic	Control (n = 52)	Only ABI (n = 52)	ABI + MT (n = 57)	P value
Mean (SD) age (years)	40.8 (1.7)	46.4 (1.6)	44.7 (1.7)	0.054[a]
Gender				
Male	47 (90.4)	38 (73.1)	43 (75.4)	0.059
Female	5 (9.6)	14 (26.9)	14 (24.6)	
Wealth index (tertiles)				
1	15 (28.9)	17 (32.7)	22 (38.6)	0.707
2	16 (30.8)	18 (34.6)	19 (33.3)	
3	21 (40.4)	17 (32.7)	16 (28.1)	
Education				
None	5 (9.6)	6 (11.5)	8 (14.0)	0.021
Primary	21 (40.4)	29 (55.8)	38 (66.7)	
Secondary/higher	26 (50.0)	17 (32.7)	11 (19.3)	
Marital status				
Married/in union	41 (78.9)	39 (75.0)	35 (61.4)	0.104
Not married	11 (21.2)	13 (25.0)	22 (38.6)	
Religion				
Catholic	18 (34.6)	29 (55.8)	25 (43.9)	0.094
Protestant	34 (65.4)	23 (44.2)	32 (56.1)	
Number of friends who drink				
0–2	14 (26.9)	18 (34.6)	16 (28.1)	0.604
3–5	17 (32.7)	14 (26.9)	23 (40.4)	
>5	21 (40.4)	20 (38.5)	18 (31.6)	
Household member drinks				
Yes	39 (75.0)	36 (69.2)	37 (64.9)	0.519
No	13 (25.0)	16 (30.8)	20 (35.1)	
Alcohol sold/made at home				
Yes	11 (21.2)	13 (25.0)	11 (19.3)	0.765
No	41 (78.9)	39 (75.0)	46 (80.7)	
Uses tobacco product				
Yes	24 (46.2)	14 (26.9)	20 (35.1)	0.122
No	28 (53.9)	38 (73.1)	37 (64.9)	
Mean (SD) AUDIT score	13.4 (3.4)	14.4 (3.6)	14.1 (3.4)	0.270[a]

[a]F test. All other P values are for chi-square tests.

ABI, alcohol brief interventions; MT, motivational talks; SD, standard deviation; AUDIT, Alcohol Use Disorders Identification Test.

Secondary outcome

We used logistic regression to examine the effect of the interventions on low-risk drinking, defined as an AUDIT score <8, at 6 months. Given the small sample size, we analysed the data using both exact logistic regression and standard logistic regression models, with and without adjusting for differences in baseline covariates. Probability values <0.05 were considered statistically significant.

Ethical considerations

The Institutional Research and Ethics Committee of Moi University College of Health Sciences and Moi Teaching & Referral Hospital, and the Scientific and Ethics Review Committee of Kenya Methodist University approved the study's protocol and tools. Literate participants provided written consent and those who were unable to write provided verbal consent to participate in the study in the presence of a witness. This was done after the data collectors had informed the participants of the purpose of the study and their right to interrupt the interview at any time or decline to be interviewed without prejudice. Participants with AUDIT scores >19, who were willing to undergo rehabilitation, were provided with information about the nearest rehabilitation centre. This study has been registered with the University Hospital Medical Information Network Clinical Trials Registry (UMIN-CTR), Japan (Reg. No. UMIN000028118).

RESULTS

A total of 161 participants (52 in the control and the only ABI groups, and 57 in the ABI + MT group) enroled in the study (Table 1). Their selection and follow-up is summarized in Appendix 3. There were no significant differences in the baseline variables across study groups, except for education; a higher proportion of participants in the control group had a higher (secondary) educational level than those in the intervention groups (P = 0.021; Table 1). The baseline mean AUDIT score was also similar across the three study groups.

The number and percent of participants with missing AUDIT scores at 1, 3 and 6 months is shown in Appendix 4. Unadjusted mean AUDIT scores were reduced in all three study groups between the baseline and 6-month assessment post-intervention, with reductions from 13.4 to 9.4, 14.4 to 7.7 and 14.1 to 6.6 in the control, only ABI and ABI + MT groups, respectively (Appendix 5).

Over time, there was a greater reduction in the adjusted mean AUDIT scores in the intervention groups than in the control group, with the greatest reduction being observed in the ABI + MT group (Fig. 1). However, the 95% CIs for the control and only ABI groups overlapped at 6 months. The adjusted mean AUDIT score was reduced between baseline and 6 months from 13.30 (95% CI: 12.35–14.25) to 9.40 (95% CI: 8.42–10.38) in the control group; from 14.17 (95% CI: 13.26–15.07) to 6.64 (95% CI: 5.69–7.60) in the ABI + MT group; and from 14.44 (95% CI: 13.50–15.38) to

7.72 (95% CI: 6.74–8.69) in the only ABI group (Appendix 6). There was strong evidence for an interaction between study group and assessment time (χ^2 = 62.0; df = 6; P <0.001).

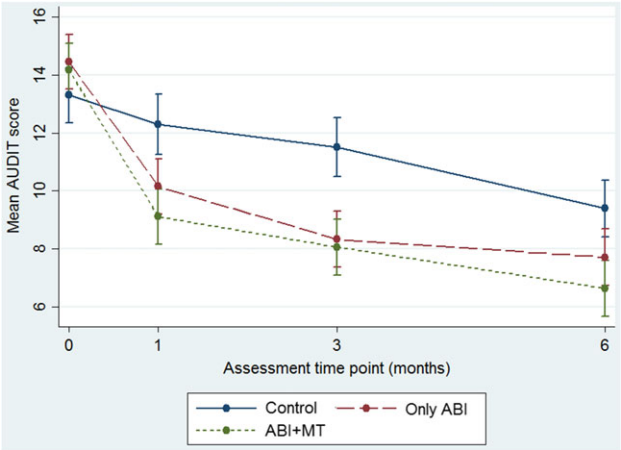

Fig. 1. Predicted mean AUDIT scores at different assessment time points among alcohol consumers in western Kenya. The figure shows education-adjusted predictions of the interaction between study arm and assessment time point. The bars represent 95% confidence intervals of the point estimates. Participants with missing data at each assessment time point were excluded.

Differences in the adjusted mean AUDIT score between the control and the intervention groups were reduced over time (Table 2). At 6 months, with reference to the control group, the mean AUDIT score was 1.68 (95% CI: 3.06–0.3; P = 0.017) lower in the only ABI group and 2.75 (95% CI: 4.14–1.37; P < 0.001) lower in the ABI + MT group (Table 2). These results were unchanged in the sensitivity analysis. In contrast, there was no difference in the mean AUDIT scores between the only ABI and ABI + MT groups at each time point (Appendix 7).

Over a 6-month period, compared with the control group, the mean AUDIT score was reduced by 1.37 (95% CI: 2.37–0.37; P = 0.007) in the only ABI group and by 2.02 (95% CI: 3.03–1.01; P < 0.001) in the ABI + MT group after adjustment for baseline education (Table 3). These results are similar to the sensitivity analysis (Table 3). There was no difference in the mean AUDIT scores over a 6-month period between the only ABI and ABI + MT groups (Appendix 8).

Secondary outcome

The percentage of participants with an AUDIT score <8 at 6 months was 29.2% (n = 48), 44.7% (n = 47), and 65.3% (n = 49) in the control, only ABI, and ABI + MT groups, respectively. After adjustment for baseline education, the odds of having an AUDIT score <8 were more than twice as high as the ABI + MT group, compared

Table 2. Mean AUDIT score differences between the control and intervention groups at 1, 3 and 6 months

Group and assessment time point	Complete case analysis		Sensitivity analysis with missing data imputed	
	Mean difference (95% CI)	*P* value	Mean difference (95% CI)	*P* value
Only ABI				
1 month	−2.13 (−3.55 to −0.72)	0.003	−1.75 (−3.09 to −0.41)	0.01
3 months	−3.16 (−4.56 to −1.77)	<0.001	−3.37 (−4.71 to −2.03)	<0.001
6 months	−1.68 (−3.06 to −0.30)	0.017	−1.69 (−3.03 to −0.35)	0.013
ABI + MT				
1 month	−3.17 (−4.60 to −1.74)	<0.001	−2.86 (−4.19 to −1.53)	<0.001
3 months	−3.43 (−4.84 to −2.03)	<0.001	−4.22 (−5.55 to −2.89)	<0.001
6 months	−2.75 (−4.14 to −1.37)	<0.001	−2.70 (−4.02 to −1.37)	<0.001

The results are adjusted for education at baseline. The table shows differences in the mean AUDIT scores between each intervention group and the control group at each assessment time point. For example, in the complete case analysis, at 1 month, the mean AUDIT score was 2.13 lower in the only ABI group than in the control group. The *P* value tests the hypothesis that this difference is zero. ABI, alcohol brief interventions; MT, motivational talk; AUDIT, Alcohol Use Disorders Identification Test.

Table 3. Average effects of the interventions on AUDIT scores over a 6-month period

Group	Model 1[a]		Model 2[b]	
	Mean difference (95% CI)	*P* value	Mean difference (95% CI)	*P* value
Complete case analysis				
Control	1		1	
Only ABI	−1.44 (−2.44 to −0.44)	0.005	−1.37 (−2.37 to −0.37)	0.007
ABI + MT	−2.16 (−3.14 to −1.18)	<0.001	−2.02 (−3.03 to −1.01)	<0.001
Sensitivity analysis[c]				
Control	1		1	
Only ABI	−1.47 (−2.47 to −0.48)	0.004	−1.42 (−2.42 to −0.42)	0.005
ABI + MT	−2.34 (−3.32 to −1.37)	<0.001	−2.23 (−3.23 to −1.23)	<0.001

[a]Unadjusted model.
[b]Adjusted for education at baseline.
[c]Missing AUDIT scores during follow-up assessments imputed.
ABI, alcohol brief interventions; MT, motivational talks; AUDIT, Alcohol Use Disorders Identification Test.

Table 4. Effects of only ABI and ABI + MT on low-risk drinking[a] at 6 months

Group	Model 1[b]		Model 2[c]	
	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Exact logistic regression				
Control	1		1	
Only ABI	1.95 (0.78–5.01)	0.175	1.94 (0.77–5.01)	0.178
ABI + MT	2.12 (1.34–3.43)	0.001	2.14 (1.32–3.57)	0.001
Standard logistic regression				
Control	1		1	
Only ABI	1.96 (0.84–4.58)	0.119	1.93 (0.82–4.55)	0.132
ABI + MT	4.57 (1.94–10.76)	0.001	4.44 (1.83–10.77)	0.001

[a]AUDIT score <8.
[b]Unadjusted model.
[c]Adjusted for education at baseline.
ABI, alcohol brief interventions; MT, motivational talks.

with the control group (OR 2.14; 95% CI: 1.32–3.57; $P = 0.001$; Table 4). The odds were also higher in the only ABI group compared with the control group, although the difference was not statistically significant (OR 1.94; 95% CI: 0.77–5.01; $P = 0.178$). The results were similar when standard logistic regression was used, although the point estimates were higher and the 95% CIs were wider for the ABI + MT group (Table 4). Compared with only ABI, ABI + MT did not have a significant effect on low-risk drinking, although the point estimates suggest an increased effect (Appendix 9).

DISCUSSION

This study found that community-based ABI and ABI + MT were associated with reduced mean AUDIT scores among hazardous and harmful alcohol consumers in a resource-limited setting. Compared with the control group, the magnitude of the reduction was greater for the ABI + MT group than for the only ABI group. Compared with only ABI, there was insufficient evidence that ABI + MT had a greater effect on the mean AUDIT score. Sensitivity analysis showed that our findings were robust. ABI + MT was associated with a 2-fold increase in the odds of low-risk drinking at 6 months post-intervention. The effect of only ABI on low-risk drinking, though positive, was not statistically significant.

Reduction in the mean AUDIT score was similar to the results reported by other studies on ABI in different settings (Moyer *et al.*, 2002; Peltzer, 2009). Our study also found a moderate reduction in the mean AUDIT score of the control group. Three factors could have contributed to this observation. First, an intensified government-led crackdown on homemade brews was initiated shortly after the study commenced. This might have caused limited access to alcohol in the study area, given that homemade brews are the most commonly consumed types of alcohol (Takahashi *et al.*, 2017). Second, the information about alcohol consumption provided to this group and the screenings for hazardous alcohol consumption using the AUDIT might have influenced subsequent alcohol consumption. Third, this study involved repeated measurements; thus, the reductions could have been a consequence of measurement reactivity. Consistent with two trials conducted in the UK (Kaner *et al.*, 2013; Drummond *et al.*, 2014), we did not find an association between only ABI and low-risk drinking at 6 months. However, the point estimates and the width of the 95% CIs indicate that our study did not have sufficient power to detect an effect as small as we observed. By adding MT to ABI, the effect of the intervention was enhanced compared to the control group.

There is no evidence of the effectiveness of ABI in resource-limited settings. To our knowledge, this is the first ABI study in sub-Saharan Africa of harmful and hazardous drinkers, in which CHWs implemented interventions targeting high-risk drinkers in the general population. The effectiveness of ABI has been reported in many countries (Babor *et al.*, 1986; Bien *et al.*, 1993; Kaner *et al.*, 2007; Gebara *et al.*, 2013; Shiles *et al.*, 2013; Tanner-Smith and Lipsey, 2015), and the WHO has recommended its use (Babor and Higgins-Biddle, 2001). However, most of the evidence of its effectiveness has been observed in studies conducted in high-income countries with interventions implemented by professional health personnel (Kaner *et al.*, 2007). Few studies on ABI have been conducted in low- and middle-income countries (Joseph and Basu, 2017) in community settings (Areesantichai *et al.*, 2013). A recent study from India reported that brief psychological treatment provided by lay counsellors in primary health-care settings reduced harmful drinking in the target population (Nadkarni *et al.*, 2017). Our study provides further evidence on the effectiveness of ABI implemented by non-professional health personnel in low-income countries.

One of the limitations of this study is its reliance on self-report measures. The participants might have under-reported their alcohol consumption because of social desirability. Loss to follow-up of participants, especially at the 3-month evaluation, is another limitation. Nevertheless, a sensitivity analysis using imputed values did not alter the results. A third limitation is the study's quasi-experimental design. Lack of random assignment to groups might have led to non-equivalent groups, thereby limiting the internal validity and generalizability of the findings. Although the comparison groups were similar in terms of their baseline characteristics (except for education, which we controlled for in the analysis), they might have differed on other unmeasured variables.

Overall, the results suggest that implementation of the interventions by the CHWs has the potential to yield good results in impoverished settings. The shortage of professional health workers in this setting rendered facility-based ABI unfeasible. We used available, community-based human resources, which is an important factor when considering the sustainability of interventions. The speakers selected for the MT interventions were former heavy drinkers from the local communities. Although we did not conduct a cost-effectiveness evaluation, this approach should be a cost-effective one, compared with facility-based interventions. Replication studies are needed on the effectiveness of ABI implemented by CHWs in different low-income countries using larger samples and preferably, randomized controlled trials.

Although this study's results are promising, tackling the problem of alcohol use disorders also requires changes in the environment to restrict access to alcohol. Our previous study found that homemade brews, namely, *chang'aa* and *busaa*, were the most commonly consumed types of alcohol in this setting (Takahashi *et al.*, 2017). These brews are cheap, culturally acceptable, and easily accessible. They are unlicensed; therefore, possessing them is illegal, but this has not stopped their production and sale. Given that economic reasons drive the home-brew business, interventions to prevent alcoholism through reducing its accessibility should include consideration of alternative sources of income for brewers and sellers.

CONCLUSIONS

The study's interventions (only ABI and ABI + MT), which were implemented by community-based laypersons, were associated with

a reduction of the mean AUDIT score of hazardous and harmful alcohol consumers. The effects of ABI + MT tended to be larger than those of only ABI, on the intervention groups when they were compared with the control group. However, the two interventions had similar effects when compared to each other. Moreover, compared with the control group, a greater effect on low-risk drinking was found in the ABI + MT group at 6 months. The long-term effects of these interventions remain unclear and a follow-up study is being planned to evaluate the sustainability of their effects.

SUPPLEMENTARY MATERIAL

Supplementary data are available at *Alcohol And Alcoholism* online.

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CONFLICT OF INTEREST STATEMENT

None declared

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The editors omitted an abstract in the ESBRA Supplement 2017. It has now been added to the issue.