Home-detoxification and relapse prevention for alcohol dependence in low resource settings: An exploratory study from Goa, India

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A R T I C L E   I N F O

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Home-detoxification
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Alcohol dependence
India
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A B S T R A C T

Despite the increasing burden of alcohol dependence, treatment resources in low- and middle-income countries such as India are concentrated in poorly accessible tertiary care facilities. The aim of our study was to examine the feasibility and acceptability of lay health worker-delivered home-based packages of care for alcohol dependence. We conducted an uncontrolled treatment cohort with alcohol-dependent adult males recruited in primary and secondary care. Lay health workers delivered home-detoxification and/or relapse prevention counseling. Process data were analyzed using descriptive statistics. Eleven men with alcohol dependence received home detoxification and relapse prevention counseling, and 27 men received only relapse prevention counseling. Of the 11 receiving home detoxification, one participant re-started drinking; all the rest safely completed the home detoxification. During detoxification, the pulse, blood pressure, and temperature remained within the normal range and ataxia, dehydration, disorientation, and sleep normalized over the course of the detoxification. Of the 38 who entered relapse prevention treatment, 15 (39.5%) completed treatment or had a planned discharge. The mean number of sessions was 2.4 (SD = 1.3); those who had a planned discharge received an average of 3.7 (SD 0.5) sessions, and those who dropped out received an average of 1.4 (SD 0.8) sessions. There was no significant change in daily alcohol consumption and percentage days of heavy drinking (PDHD) between baseline and follow-up in the whole cohort. The SIP score reduced significantly in the whole cohort (24.5 vs. 15.0, p = 0.002), and also reduced when segregated by treatment settings, and type of treatment package received. With appropriate adaptations, our intervention warrants further research, as it has the potential to bridge the significant treatment gap for alcohol dependence in low- and middle-income countries.

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Introduction

Alcohol use is linked causally to several disease and injury categories, with more than 40 WHO International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) categories being fully attributable to alcohol (Rehm et al., 2017). Among all mental and substance disorders, alcohol use disorders (AUDs) are one of the leading causes of disability, and the largest contributor to premature mortality. Overall, AUDs are one of the five leading risk factors for adult chronic disease (Forouzanfar et al., 2016; Vos et al., 2017). In India, there are high rates of alcohol-attributable mortality and prevalence of AUDs, relative to the per capita volume of alcohol consumed (Benegal, 2005; Rehm et al., 2009).

Alcohol dependence, the most severe form of AUD, is a direct cause of premature death and disability, and a risk factor for other communicable (e.g., tuberculosis and HIV) and non-communicable (e.g., hypertension and stroke) diseases (Holst, Tolstrup, Sørensen, & Becker, 2017; Rehm et al., 2017; Schoepf & Heun, 2015; Wood et al., 2018). It also impacts multiple domains of the affected person's life, including reduced productivity, job loss or absenteeism, loss of relationships, problems with family roles, vandalism, social drift downward, and stigma. The official response in India to the

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growing public health problem of alcohol dependence remains focused primarily on funding tertiary care services. However, such services are scarce, resource-intensive, and often difficult to access because of financial or geographical factors (Dhawan, Rao, Ambekar, Pusp, & Ray, 2017; National Collaborating Centre for Mental Health, 2011), and are certainly not indicated for less severely dependent patients (Day, Copello, & Hull, 2015; National Collaborating Centre for Mental Health, 2011; Spithoff & Kahan, 2015). For instance, many of the detoxification and ‘counseling’ centers that fall under the remit of the National Drug De-addiction Programme (Prasad, 2009) in India are defunct, and the existing centers are not adequate to address the psychosocial needs of patients and their families (Dhawan et al., 2017; Mattoo, Singh, & Sarkar, 2015; Prasad, 2009). Hence, the treatment of alcohol dependence in existing platforms of institutional care in India is both limited by its accessibility, and sub-optimal, because community-based care is rarely available despite it being recommended in most cases (National Collaborating Centre for Mental Health, 2011) as both a viable and efficient solution (Ibrahim & Glivary, 2005). As a result, a large proportion of people with AUD in India do not have access to help for their alcohol-related problems, leading to a high treatment gap of 86% (Gururaj, Varghese, Benegal, & Rao, 2016).

Efficient utilization of limited resources for treatment of mild to moderate dependence involves community-based treatment through home-based assisted withdrawal programs involving fixed dose medication regimens whenever indicated, a caregiver overseeing the process with daily monitoring by trained staff, and psychosocial support (National Collaborating Centre for Mental Health, 2011). Such a program, based on the principle of collaborative care, overcomes challenges related to accessibility and acceptability of treatment, which are often found in low resource settings (Nadkarni & Bhatia, 2019; Wright et al., 2018). However, there is no robust evidence about the acceptability, feasibility, and effectiveness of community-based detoxification in low- and middle-income countries (LMICs) (Nadkarni, Endsley, et al., 2017).

The aim of CONTAD (Community Orientated Non-specialist Treatment of Alcohol Dependence), a community program for alcohol dependence, was to systematically develop a lay health worker (LHW)-delivered home-based package of care for alcohol dependence that addresses the acute care needs related to alcohol detoxification and the longer term goals of relapse prevention. Home-based detoxification has several potential benefits for low resource settings – continued routine life and social ties, detoxification within a familiar setting with family support, continuation of work, support to family members, and less stigma (Fleeman, 1997). Finally, there is evidence from high-income countries (HICs) that community detoxification as outlined above (fixed dose medication regimens, a caregiver overseeing the process, daily monitoring by trained staff, and psychosocial support) can be delivered by well-trained non-specialist health workers (Nadkarni, Endsley, et al., 2017), and that well-trained non-specialist health workers can be recruited and utilized effectively within LMICs to undertake a range of health- and psychosocial-related tasks (Nadkarni, Weobong, et al., 2017; van Ginneken et al., 2013).

This paper describes the case series, one of the phases of the intervention development process, which aimed to demonstrate the acceptability, feasibility, and safety of the CONTAD package of care for alcohol dependence. The package of care was developed through a rigorous process developed in the study setting (Nadkarni, De Silva, & Patel, 2014) and included a) a systematic review to identify evidence-based components for the home-detoxification intervention (Nadkarni, Endsley, et al., 2017), b) utilization of a systematic review conducted in a different study that developed an intervention for harmful drinkers in the same setting (Nadkarni et al., 2015), c) qualitative interviews with patients with alcohol dependence, their family members, and clinicians, and d) intervention development workshops at two de-addiction centers of excellence in India.

Materials and methods

Setting and target population

Goa is a state on the west coast of India with a population of just over 1.4 million people (Government of India, 2011). The prevalence of current drinking among men attending primary care is 55% and the prevalence of hazardous drinking is 15% (D’Costa et al., 2007).

This study was conducted in two settings: a) primary care clinics (five in the public and three in the private sector), and b) a de-addiction center in a secondary care district hospital. We only recruited males, because of the very low prevalence of AUD in women in India (Murthy, Manjunatha, Subodh, Chand, & Benegal, 2010).

Study design

Treatment cohort with before-and-after design.

Sample

As this was a proof of concept study, we recruited a convenience sample of participants identified in four ways a) self-referral, b) referral by primary care physicians/general practitioners, c) universal screening in primary care, and d) referral from a secondary care de-addiction center. All patients, except those referred from a de-addiction center, were administered the Alcohol Use Disorders Identification Test (AUDIT), a 10-item screening questionnaire developed by the World Health Organization for the detection of probable AUD (Saunders, Aasland, Babor, Fuente, & Grant, 1993). It has been validated and used in India (Pal, Jena, & Yadav, 2004), and a vernacular version has been used extensively in the study settings (Nadkarni, Weobong, et al., 2017). Adult (>18 years) male participants were eligible for inclusion in the study if they scored >20 on AUDIT, indicating possible alcohol dependence. Participants who scored 16 to 19 (possible harmful drinkers) on the AUDIT were asked follow-up questions to identify those with symptoms of alcohol withdrawal (Appendix 1). Anyone screening positive on these follow-up questions was also included in the case series. Finally, any patient admitted to the secondary care de-addiction center for inpatient detoxification was eligible for participation in the relapse prevention component after completion of the detoxification. Exclusion criteria included the following: age <18 years, difficulty with hearing or speaking that made interviewing difficult, inability to speak the local vernacular or English, or the patient being in a critical condition and not able to answer assessment questions.

Sampling and sample sizes

As CONTAD aimed at treatment development, assessment of acceptability, and feasibility of the intervention package and generation of preliminary estimates of impact, no formal sample size estimations were carried out. Sample size for the treatment cohort was based on experience of previous intervention development projects, feasibility of recruitment, and adequacy to meet study objectives.
Procedures

Consenting participants from primary care were assessed by the LHWs for preliminary eligibility (Appendix 2) to undergo home detoxification. The primary care physician determined the final eligibility for home-based detoxification based on clinical examination and laboratory tests (Appendix 3). The eligibility criteria for home detoxification are listed in Box 1. Participants who were not eligible to undergo home-detoxification at either of these assessments were referred to the de-addiction center for inpatient detoxification. For participants eligible for home detoxification, the LHWs assessed the drinking history (Appendix 4), explained (verbal and written) the detoxification process to the patient, and designated a caregiver and obtained informed consent from both. The primary care physician then prescribed medications for home detoxification as per protocol, which was then monitored by the LHW.

LHWs

Six female LHWs and one supervisor (also an LHW) participated in the study. They had no formal qualifications in the field of mental health, but had completed at least secondary school education. They underwent training in the home detoxification intervention and relapse prevention intervention for three days each. They also underwent a refresher training of four days, 6 months after the initial training. The training was delivered primarily by an experienced psychologist and psychiatrist. It was designed around the intervention manuals and included didactic lectures, videos, demonstrations, and role-plays. Some of the learning goals in the home detoxification training included understanding the features of alcohol dependence and alcohol withdrawal, learning how to do a detailed assessment of a person with alcohol dependence, understanding the role of various medications used in the alcohol detoxification process, learning how to measure blood pressure, pulse and temperature, learning how to identify nystagmus, ophthalmoplegia and ataxia, and learning how to check for orientation to time, space, and person. The relapse prevention counseling training focused on learning goals such as learning how to enhance motivation to change, identifying relapse triggers, helping the patient to deal with the triggers using skills such as handling peer pressure, and dealing with lapses and relapses. They received weekly peer-group supervision, which involved rating of randomly selected recorded sessions on the CONTAD Therapy Quality Scale (Appendix 5) developed specifically for the study.

Interventions

The interventions described below were delivered according to specific protocols developed for the program [http://www.sangath.in/contad/]. Home detoxification involved once or twice daily home visits as per need, daily monitoring using the Clinical Institute Withdrawal Assessment for Alcohol, revised version (CIWA-Ar) (Sullivan, Sykora, Schneiderman, Naranjo, & Sellers, 1989), monitoring of pulse, blood pressure, temperature, nystagmus, ophthalmoplegia, ataxia, dehydration, orientation, sleep, level of sedation, symptoms of delirium, side effects of medications, compliance with medications, and continued abstinence. The designated caregiver and patient could contact the LHW over the phone or access the nearest hospital in case of any emergency, such as a seizure. For patients undergoing home detoxification, relapse prevention counseling was commenced on completion of detoxification or as soon as the patient was physically comfortable during the course of the detoxification. For alcohol-dependent patients who were currently not consuming alcohol and those who had completed detoxification at the de-addiction center, the counseling was started as soon as the patient consented to participation. The counseling was delivered over 4–8 weeks through up to four sessions, each lasting 30–60 min. The content of the sessions included reviewing the patient’s drinking history and presenting personalized feedback, preparing to avoid a lapse by learning how to identify and deal with triggers, learning how to deal with a lapse, and learning what to do if a lapse turned into a relapse. A participant was classified as a ‘planned discharge’ if at least one of the following criteria were met: participant’s exit from treatment was decided in collaboration with the LHW, or the maximum of four sessions was completed.

Ethics

The study was approved by the ethics committees at the implementing organization, the Indian Council of Medical Research, and the state Directorate of Health Services. Anyone screening positive for hazardous or harmful drinking was provided a leaflet that specified the signs and risks associated with drinking problems, and listed self-help strategies to manage drinking.

Data

The following data were collected during the course of the study.

(1) Process indicators: Data were collected on patients who screened positive, patients accepting treatment, those who refused treatment, and those who completed treatment. Information was also collected on adverse events and drop-outs. Serious adverse events were defined as any of the
following: death due to any cause, attempted suicide, and unplanned hospitalization.

(2) Clinical indicators: Number of sessions, location of session delivery, duration of session, and number of days between sessions.

(3) Outcome assessment: Alcohol (in g) consumed in the 2 weeks preceding the outcome assessment, heavy drinking days, and Short Inventory of Problems (SIP) score. The SIP is a 15–item questionnaire that measures physical, social, intrapersonal, impulsive, and interpersonal consequences of alcohol consumption. The SIP is a validated tool (Feinn, Tennen, & Kranzler, 2003) that has been used in the study setting (Nadkarni, Weobong, et al., 2017). Alcohol consumption in the past 2 weeks and heavy drinking days were measured using the Time Line Follow Back (TLFB), a calendar tool supplemented by memory aids to obtain retrospective estimates of daily drinking over a specified time period. The TLFB is a validated instrument (Sobell & Sobell, 1992) that has been used in the study setting (Nadkarni, Weobong, et al., 2017). The TLFB was used to calculate mean daily alcohol consumption and percentage days of heavy drinking (PDHD). These assessments were conducted at baseline and 3 months post-recruitment.

Analyses

Process indicators of the screening and treatment process are presented as proportions and means as appropriate. Socio-demographic characteristics of the sample are summarized as means and proportions as appropriate. The median pre- and post-scores on the outcome tools were compared using the Wilcoxon signed-rank test. Sub-group analysis was conducted based on treatment completion, and type of treatment (detoxification and relapse prevention vs. relapse prevention only). Analyses were conducted using Stata14.

Results

Feasibility of screening in primary care and acceptability of recruitment procedures to patients in primary care

Participants were recruited through a sequential process (Fig. 1). We gained access to 7013 patients, 1000 (14.3%) in the private sector clinics and 6013 (85.7%) in the public sector clinics, through universal screening or referrals. Of these, 5006 (71.4%) agreed to be assessed for eligibility for screening, and 3251 (64.9%) were eligible for screening. Of the 3251 screened, 2225 (68.4%) were ever drinkers and 1414 (43.5%) were current drinkers. Two-thirds (63.6%) of the ever drinkers were current drinkers. The mean AUDIT score among current drinkers was 8.5 (SD = 7.4), and the prevalence of alcohol dependence among current drinkers was 140 (10.1%).

Thirty-five harmful drinkers were also screened using the additional questions. Based on that, 22 (62.9%) were diagnosed to have alcohol dependence. Additionally, seven participants were recruited in the public sector clinics immediately after inpatient detoxification in the tertiary care de-addiction center. One participant did not agree to the consenting process. Of the remaining 168 with alcohol dependence, 38 (22.6%) consented to participate in the study. Despite screening positive for alcohol dependence on the AUDIT, 27 were currently abstinent and did not have any acute withdrawal symptoms (seven after a recently completed inpatient detoxification), and 11 were currently consuming alcohol. The former were directly recruited to receive relapse prevention counseling, and the latter were recruited to receive home detoxification followed by relapse prevention counseling.

Acceptability, feasibility, and safety of medically assisted detoxification by LHWs in patients’ homes

Eleven participants started detoxification. Their mean age was 38.2 (SD = 10.6) years and mean AUDIT score was 24.9 (SD = 9.0); the predominant proportion had at least some education (81.8%), were employed (81.8%), married (81.8%), and recruited in the public sector clinics (81.8%) (Supplementary Table 3). One participant (9.1%) was excluded after day 4 as he re-started consuming alcohol. Six participants completed detoxification on day 5, and two participants each completed detoxification on day 6 and day 7, respectively.

Table 1 describes the CIWA-Ar scores, and Fig. 2A and B describe the clinical indicators through the course of the detoxification. The severity of withdrawal was predominantly mild to moderate, and the severity steadily decreased over the course of the detoxification. All clinical parameters that were assessed either remained within the normal range (pulse, BP, temperature) or normalized if it was abnormal (ataxia, dehydration, disorientation, sleep) over the course of the detoxification.

During the course of the detoxification, two serious adverse events were reported, both unplanned hospitalizations. In one case, the admission was for severe tremulousness, which was mis-interpreted by the caregiver as a seizure. An assessment of the other serious adverse event could not be made, as the patient did not agree for a formal evaluation of the serious adverse event by a specialist, despite multiple requests.

Acceptability and feasibility of relapse prevention counseling by LHWs

Of the 38 who entered relapse prevention treatment, 15 (39.5%) completed treatment or had a planned discharge. There were no statistically significant differences on intake variables between those who completed treatment or had a planned discharge, compared to those who dropped out of treatment (Supplementary Table 4). There were no statistically significant differences on intake variables between those who received detoxification and relapse prevention compared to those who received only relapse prevention (Supplementary Table 5).

Details of the relapse prevention counseling are described in Table 2 and Table 3.

Of the 38 participants who entered treatment, 2 (5.3%) dropped out before starting relapse prevention counseling, 10 (26.3%) completed all four sessions, 8 (21.1%) completed three sessions, 5 (13.2%) completed two sessions, and 13 (34.2%) completed one session. The mean number of sessions was 2.4 (SD = 1.3), after excluding the two who did not get a single session. Those who had a planned discharge received an average of 3.7 (SD 0.5) sessions and those who dropped out received an average of 1.4 (SD 0.8) sessions. There were no significant differences in mean number of sessions and mean duration of treatment between those who received detoxification and relapse prevention compared to those who only received relapse prevention. The mean duration of sessions reduced from session 1 to session 3 before increasing again in the final session. The highest proportion of session 1 was conducted in
the clinic, and this proportion gradually reduced over the duration of treatment, with the highest proportion of session 4 conducted in the patients’ homes. Finally, the mean number of days between sessions increased as the treatment progressed from session 1 to session 4 (from 16 to 31 days).

Feasibility of measuring drinking and related outcomes (Tables 4a and 4b)

At baseline, TLFB was available for 36 (94.7%) participants, and SIP was available for 32 (84.2%) participants. At follow-up, TLFB and
SIP were available for 35 (92.1%) participants. There was no significant difference in daily alcohol consumption and PDHD between baseline and follow-up in the whole cohort and when segregated by treatment settings, severity of dependence, and number of sessions attended. However, there was a significant difference between baseline and follow-up in a) daily alcohol consumption in those who completed treatment (median 20.7 vs. 0, \( p = 0.04 \)), b) PDHD in those who received home detoxification and

### Table 1

Clinical indicators of home detoxification.

<table>
<thead>
<tr>
<th>Day</th>
<th>N</th>
<th>Day 1</th>
<th>N</th>
<th>Day 2</th>
<th>N</th>
<th>Day 3</th>
<th>N</th>
<th>Day 4</th>
<th>N</th>
<th>Day 5</th>
<th>N</th>
<th>Day 6</th>
<th>N</th>
<th>Day 7</th>
<th>N</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Mean CIWA-Ar score (SD)</td>
<td>8.5 (5.0)</td>
<td>5.5 (4.1)</td>
<td>4.8 (4.7)</td>
<td>3.5 (4.3)</td>
<td>2.4 (3.2)</td>
<td>0 (0)</td>
<td>0 (0)</td>
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<tr>
<td></td>
<td></td>
<td>CIWA-Ar ≤8 (mild withdrawal) n (%)</td>
<td>5 (45.5)</td>
<td>8 (72.7)</td>
<td>9 (81.8)</td>
<td>10 (90.9)</td>
<td>10 (100.0)</td>
<td>4 (100.0)</td>
<td>2 (100.0)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>CIWA-Ar 9-15 (moderate withdrawal) n (%)</td>
<td>4 (36.4)</td>
<td>3 (27.3)</td>
<td>2 (18.2)</td>
<td>1 (9.1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
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<tr>
<td></td>
<td></td>
<td>CIWA-Ar &gt;15 (severe withdrawal) n (%)</td>
<td>2 (18.2)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
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</tbody>
</table>

Clinical Institute Withdrawal Assessment of Alcohol Scale, Revised (CIWA-Ar), Standard Deviation (SD).

Fig. 2. a. Clinical parameters during home detoxification b. Clinical parameters during home detoxification.
relapse prevention counseling (median 35.7 vs. 0.006), c) SIP scores in the whole cohort (24.5 vs. 15.0, p = 0.002), in those with milder alcohol dependence (median 24.0 vs. 10.0, p = 0.02), those who attended more sessions (median 26.5 vs. 15.0, p = 0.02), and those who dropped out of treatment (median 24.5 vs. 22.0, p = 0.03).

Adaptations to the home detoxification manual

Some of the things learned during the course of the study that resulted in adaptations to the detoxification are described in Table 5.

Discussion

Our study examines the acceptability, feasibility, and safety of a contextually adapted package for home detoxification and relapse prevention delivered by lay health workers, the first such study from India. Our findings indicate that it is feasible to identify and recruit patients with alcohol dependence into a program that delivers home detoxification and relapse prevention counseling through LHWs. Importantly, such a program is acceptable to the recipients to some extent, is feasible, and is safe to deliver.

Our study had a low consent and a high dropout rate, with only 40% of those entering the program completing treatment. Low rates of entry into and high dropout rates from substance misuse treatment are not unusual. In better resourced settings, such as in Europe, <20% of all AUD cases identified receive treatment for their alcohol problems in the 12 months preceding identification (Manthey et al., 2016), and treatment contact is reported to be no more than 20% in the year of onset, even for alcohol dependence (Oakley Browne, Wells, Mcgee, & New Zealand Mental Health Survey Research Team, 2006; Wang et al., 2005). Some common reasons for not entering treatment for AUD include beliefs that one should be strong enough to handle their drinking problem by themselves, that drinking problems resolve by themselves, and that one’s drinking problem is not serious enough to require treatment (Grant, 1997). High dropout rates are not unique to AUDs, with rates being as high (31–60%) for a range of other mental health treatment programs (Keil & Esters, 1982). More specifically, completion rates for standard outpatient adult alcohol treatment programs are as low as 40% (Wickizer et al., 1994).

On the other hand, we observed high completion rates for the home detoxification component of our study. The detoxification process was largely clinically uneventful, patients and their caregivers adhered to the protocol, and there were no serious adverse events resulting directly from the detoxification. This is consistent with findings reported in other studies (Nadkarni, Endsley, 2017). The impact of home detoxification has been examined using a range of study designs. In experimental studies, those who underwent community detoxification (compared to patients undergoing facility-based detoxification) were more likely to be drinking less or abstinent (Nadkarni, Endsley, et al., 2017). In non-controlled studies of home detoxification such as ours, there was a significant reduction in quantity and frequency of drinking and also impact of drinking at follow-up (Nadkarni, Endsley, et al., 2017).

The only other study that examined community detoxification in an LMIC was conducted in Brazil and compared conventional outpatient treatment for alcohol dependence with conventional outpatient treatment supplemented by home visits (Moraes, de Campos, Figlie, Ferraz, & Laranjeira, 2010). The latter was superior with regard to a range of clinical outcomes. In the absence of an evidence base from LMICs, our study is crucial as it demonstrates the workability of a potential solution to bridging the AUD treatment gap in a low-resource setting. In our study, there was a significant difference between baseline and follow-up for daily alcohol consumption and heavy drinking in those who received both home detoxification and relapse prevention counseling, but not in those who received only the latter. We also observed a similar significant difference in the SIP scores, in the whole cohort, in those who had milder alcohol dependence, had a longer duration of treatment, and attended more sessions. All of these findings, combined with the low mean number of sessions received, indicate the need for ongoing care to improve outcomes in alcohol dependence. It is possible that when the same LHWs undertake both detoxification and relapse prevention counseling, it is much more likely to be
The strategies that are already specified in the manual, such as exploring ambivalence and encouraging the involvement of significant others. Finally, in our study, the primary care physicians were very well engaged with their tasks of examining the patient’s eligibility for home detoxification and prescribing medications. However, they could potentially play a greater role in a collaborative care model where they contribute to other critical processes such as supervision of the LHWs. On the other hand, such compliance in dealing with alcohol withdrawal and detoxification certainly cannot be taken for granted, and it is very likely that a coordinated education and attitude-modification program would be needed in order to implement methods such as these into routine clinical practice within primary care.

This is a first study from India examining the feasibility, acceptability, and safety of an intervention package for alcohol dependence delivered by LHWs in the community. Its strengths lie in its participatory methods used to design the intervention, primary care approach to recruitment, and innovative delivery method. Our study has weaknesses as well, and these need to be considered while interpreting our findings. The sample size limits the precision of our findings and the absence of a control arm means that we cannot attribute any changes in the outcome measures directly to the intervention. Another limitation is the use of AUDIT to identify alcohol dependence. The cut-off score to identify alcohol dependence has not been well validated, but a cut-off score of 20 is in agreement with expert guidance on the use of this instrument, and dependence has been identified in primary care populations at lower scores (Johnson, Lee, Vinson, & Seale, 2013). This limitation was offset to a certain extent in our study by using additional questions, which allowed us to use symptomatology to identify alcohol dependence that might have been missed by the AUDIT. Our stringent eligibility criteria ensured that only those with less severe alcohol dependence were included in the study. Although this limits the generalizability of our findings, it ensured

### Table 4a
Comparison of drinking and its impact at baseline and follow-up.

<table>
<thead>
<tr>
<th></th>
<th>All participants</th>
<th>Relapse prevention</th>
<th>p</th>
<th>Detoxification</th>
<th>p</th>
<th>Dropped out N = 23</th>
<th>p</th>
<th>Completed treatment or planned discharge N = 15</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median daily alcohol consumed in grams (Range)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Baseline</td>
<td>24.9 (0–28.1)</td>
<td>0.67</td>
<td>13.3 (0–149.3)</td>
<td>0.17</td>
<td>44.8 (15.7–281.5)</td>
<td>0.005</td>
<td>33.0 (0–149.3)</td>
<td>0.25</td>
<td>20.7 (0–281.5)</td>
</tr>
<tr>
<td>Follow-up</td>
<td>14.4 (0–135.3)</td>
<td>32.5 (0–135.3)</td>
<td>4.1 (0–69.9)</td>
<td>47.9 (0–135.3)</td>
<td>0.00</td>
<td>0.0 (0–96.2)</td>
<td>0.04</td>
<td></td>
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<tr>
<td><strong>Median PDHD (Range)</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Baseline</td>
<td>28.6 (0–100)</td>
<td>0.64</td>
<td>17.9 (0–100)</td>
<td>0.21</td>
<td>35.7 (14.3–100)</td>
<td>0.006</td>
<td>28.6 (0–100)</td>
<td>0.42</td>
<td>21.4 (0–85.7)</td>
</tr>
<tr>
<td>Follow-up</td>
<td>7.1 (0–100)</td>
<td>7.1 (0–100)</td>
<td>0.0 (0–100)</td>
<td>42.9 (0–100)</td>
<td>0.00</td>
<td>0.0 (0–92.9)</td>
<td>0.05</td>
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<td><strong>Median SIP score (Range)</strong></td>
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<tr>
<td>Baseline</td>
<td>24.5 (3–44)</td>
<td>0.002</td>
<td>24.5 (3–44)</td>
<td>0.02</td>
<td>25.0 (3–42)</td>
<td>0.04</td>
<td>24.5 (3–42)</td>
<td>0.03</td>
<td>26.5 (10–44)</td>
</tr>
<tr>
<td>Follow-up</td>
<td>15.0 (0–41)</td>
<td>22.0 (0–41)</td>
<td>12.5 (0–39)</td>
<td>22.0 (0–41)</td>
<td>12.5 (0–39)</td>
<td>0.04</td>
<td>26.5 (10–44)</td>
<td>0.05</td>
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</tbody>
</table>

Percentage days heavy drinking (PDHD), Short Inventory of Problems (SIP).

successful because these LHWs have been visiting the patients in their homes, and have made positive therapeutic relationships with both the patient and their caregiver. On the other hand, if the patient is detoxed in a facility, separated both geographically and in its orientation with CONTAD, then there may be far less engagement with the relapse prevention counseling.

Historically, treatments for AUD have been delivered for circumstances duration or intensity, and are expected to produce impact lasting well beyond the end of treatment. However, this is in contrast to treatments of other chronic medical conditions, which include acute care strategies followed by longer-term follow-up and strategies. Thus, in AUD, we may be missing opportunities to maximize the potential benefits of existing treatments by focusing on interventions delivered in a few sessions over a short period of time (McLellan, 2002). A more appropriate response for alcohol dependence would be to maintain therapeutic contact for extended periods of time and to adjust the intensity of treatment in response to changes in symptoms and functioning over time (McKay, 2005).

A study from India in which the intervention group received weekly continued-care in the community, compared to routine hospital follow-up visits, showed that the former group had more non-drinking days and that they continued to maintain these gains while the control group showed a downward slide (Murthy et al., 2009). Thus, one of the adaptations that will have to be made to the CONTAD relapse prevention intervention is to individualize treatment planning so that the length of follow-up care can be matched to patient requirements in order to achieve sustained change in drinking outcomes.

The other major adaptation would have to be around strategies to engage and retain patients in treatment. These could include strategies implemented before treatment begins (e.g., reviewing potential barriers to adherence) and those implemented during treatment (e.g., calling patients to check on their status on the same day that they miss a session) (Carroll, 1997). These are in addition to the strategies that are already specified in the manual, such as exploring ambivalence and encouraging the involvement of significant others. Finally, in our study, the primary care physicians were very well engaged with their tasks of examining the patient’s eligibility for home detoxification and prescribing medications. However, they could potentially play a greater role in a collaborative care model where they contribute to other critical processes such as supervision of the LHWs. On the other hand, such compliance in dealing with alcohol withdrawal and detoxification certainly cannot be taken for granted, and it is very likely that a coordinated education and attitude-modification program would be needed in order to implement methods such as these into routine clinical practice within primary care.

This is a first study from India examining the feasibility, acceptability, and safety of an intervention package for alcohol dependence delivered by LHWs in the community. Its strengths lie in its participatory methods used to design the intervention, primary care approach to recruitment, and innovative delivery method. Our study has weaknesses as well, and these need to be considered while interpreting our findings. The sample size limits the precision of our findings and the absence of a control arm means that we cannot attribute any changes in the outcome measures directly to the intervention. Another limitation is the use of AUDIT to identify alcohol dependence. The cut-off score to identify alcohol dependence has not been well validated, but a cut-off score of 20 is in agreement with expert guidance on the use of this instrument, and dependence has been identified in primary care populations at lower scores (Johnson, Lee, Vinson, & Seale, 2013). This limitation was offset to a certain extent in our study by using additional questions, which allowed us to use symptomatology to identify alcohol dependence that might have been missed by the AUDIT. Our stringent eligibility criteria ensured that only those with less severe alcohol dependence were included in the study. Although this limits the generalizability of our findings, it ensured

### Table 4b
Comparison of drinking and its impact at baseline and follow-up.

<table>
<thead>
<tr>
<th></th>
<th>Baseline AUDIT*</th>
<th>Baseline AUDIT*</th>
<th>Attended up to 2 sessions</th>
<th>p</th>
<th>Attended &gt;2 sessions</th>
<th>p</th>
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<tr>
<td><strong>Median daily alcohol consumed in grams (Range)</strong></td>
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<tr>
<td>Baseline</td>
<td>25.2 (0–105.9)</td>
<td>13.3 (0–149.3)</td>
<td>35.0 (0–149.3)</td>
<td>0.29</td>
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<tr>
<td>Follow-up</td>
<td>2.8 (0–135.3)</td>
<td>51.4 (0–191.9)</td>
<td>42.3 (0–135.3)</td>
<td>0.00</td>
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<tr>
<td><strong>Median PDHD (Range)</strong></td>
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</tr>
<tr>
<td>Baseline</td>
<td>28.6 (0–100)</td>
<td>143.0 (0–85.7)</td>
<td>32.1 (0–100)</td>
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<tr>
<td>Follow-up</td>
<td>0.0 (0–100)</td>
<td>39.3 (0–92.9)</td>
<td>35.7 (0–100)</td>
<td>0.70</td>
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<tr>
<td><strong>Median SIP score (Range)</strong></td>
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</tr>
<tr>
<td>Baseline</td>
<td>24.0 (3–44)</td>
<td>30.0 (17–42)</td>
<td>22.0 (3–42)</td>
<td>0.10</td>
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<td></td>
</tr>
<tr>
<td>Follow-up</td>
<td>10.0 (0–38)</td>
<td>25.5 (5–41)</td>
<td>22.0 (0–41)</td>
<td>15.0</td>
<td></td>
<td></td>
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</tbody>
</table>

Alcohol Use Disorder Identification Test (AUDIT), Percentage days heavy drinking (PDHD), Short Inventory of Problems (SIP).

* Excluding 7 participants who were eligible by virtue of having completed inpatient detoxification just prior to recruitment.
that patients having complex alcohol dependence with the potential for adverse outcomes were not put at risk by undergoing detoxification in settings with limited medical supervision.

The evidence base for treatment of alcohol dependence, both for home detoxification and relapse prevention, is predominantly derived from high-income countries, and is focused on specialist settings and delivery (Project MATCH Research Group, 1997; Nadkarni, Endsley, et al., 2017; UKATT Research Team, 2005; World Health Organization, 2015). Hence, CONTAD is unique, as it is designed to be delivered by LHWs in primary care settings, making it potentially scalable in low resource settings with a shortage of specialist healthcare professionals. Considering the feasibility, accessibility, and safety of CONTAD and the encouraging change in some outcomes in the positive direction, further research on CONTAD is warranted. This could include a trial of CONTAD, adapted based on the findings of this formative research. If effective, such a contextually appropriate intervention for alcohol dependence could be a substantial achievement, as it is the first comprehensive intervention for alcohol dependence developed in an LMIC and is designed to meet the acute care and longer-term needs of those with alcohol dependence. Finally, if effectiveness of CONTAD is established, further implementation of scientific research would help test the scalability of the intervention inherent in its suitability for non-specialist health worker delivery and processes such as peer supervision. In conclusion, our findings warrant further research on CONTAD, as it has the potential to bridge the significant treatment gap for alcohol dependence in LMICs.

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Declaration of Competing Interest

The authors have no conflict of interest and financial interest or benefit that has arisen from the direct applications of this research.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.alcohol.2019.08.006.

References


