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Commitment Strength, Alcohol Dependence and HealthCall Participation: Effects on Drinking Reduction in HIV Patients

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Abstract

BACKGROUND—The role of three factors in drinking outcome after brief intervention among heavily drinking HIV patients were investigated: strength of commitment to change drinking, alcohol dependence, and treatment type: brief Motivational Interview (MI) only, or MI plus HealthCall, a technological extension of brief intervention.

METHODS—HIV primary care patients (N=139) who drank 4 drinks at least once in the 30 days before study entry participated in MI-only or MI+HealthCall in a randomized trial to reduce drinking. Patients were 95.0% minority; 23.0% female; 46.8% alcohol dependent; mean age 46.3. Outcome at end of treatment (60 days) was drinks per drinking day (Timeline Follow-Back). Commitment strength (CS) was rated from MI session recordings.

RESULTS—Overall, stronger CS predicted end-of-treatment drinking ($p<.001$). After finding an interaction of treatment, CS and alcohol dependence ($p=.01$), we examined treatment $\times$ CS interactions in alcohol dependent and non-dependent patients. In alcohol dependent patients, the treatment $\times$ commitment strength interaction was significant ($p=.006$); patients with low commitment strength had better outcomes in MI+HealthCall than in MI-only (lower mean drinks per drinking day; 3.5 and 4.6 drinks, respectively). In non-dependent patients, neither treatment nor CS predicted outcome.

CONCLUSIONS—Among alcohol dependent HIV patients, HealthCall was most beneficial in drinking reduction when MI ended with low commitment strength. HealthCall may not merely extend MI effects, but add effects of its own that compensate for low commitment strength. Thus,

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Contributors

Deborah Hasin and Efrat Aharonovich designed and conducted the study, and contributed to the writing of the manuscript. Malka Stohl conducted analyses and contributed to the writing of the manuscript. James Ellis contributed to the writing of the manuscript. Paul Amrhein contributed to final draft of the manuscript. All authors have read and approved the final manuscript.

Conflict of Interest

No conflict declared.

HealthCall may also be effective when paired with briefer interventions requiring less skill, training and supervision than MI. Replication is warranted.

Keywords

commitment language; brief intervention; heavy drinking; IVR; MI; HIV

1. INTRODUCTION

Among those with HIV, heavy drinking is linked to lower antiretroviral medication adherence and effectiveness, HIV disease progression, and liver toxicity (Azar et al., 2010; Hahn and Samet, 2010; Samet et al., 2007; Shuper et al., 2010). With liver disease a leading cause of death among people with HIV/AIDS (Joshi et al., 2011; Weber et al., 2006), reducing heavy drinking among those with HIV is important to their health and survival. Of five randomized trials of behavioral interventions in adult HIV-infected populations that reported alcohol outcomes, two did not find treatment effects on drinking (Parsons et al., 2007; Samet et al., 2005), while three were successful (Meade et al., 2010; Papas et al., 2011; Velasquez et al., 2009). However, the successful treatments took 6–15 sessions (9–22.5 hours) to achieve their results. Limited staff time and resources in HIV primary care clinics generally preclude such treatment within the clinic (Metsch et al., 2008; Strauss and Mino, 2011; Strauss et al., 2012, 2009) and patients seldom follow referrals from medical settings to outside alcohol treatment (Miller et al., 2006; Saitz, 2010). Thus, if briefer drinking-reduction interventions within the HIV medical setting were effective, they could provide an important means of helping HIV patients who drink heavily.

In general medical settings, brief drinking-reduction interventions for heavy drinkers identified through screening have been studied extensively, as covered in reviews and meta-analyses (Moyers et al., 2002; Babor et al., 2007; Saitz, 2010). The “brief” interventions have been defined various ways (Moyers et al., 2002), often 1–4 sessions, typically no more than 30 minutes (Babor, 1994; Moyers et al., 2002). A commonly used element in such interventions is increasing motivation to change (Moyers et al., 2002; Babor et al., 2007; Saitz 2010). As the reviews indicate, abundant evidence favors the efficacy of such interventions in patients whose drinking problems are not severe. However, in Moyers et al., 2002, the effect of brief interventions compared to control conditions was significantly larger in studies that excluded individuals with severe alcohol problems ($N=27$) than those that did not ($N=7$), and the pooled effect size differed significantly from zero when the seven studies were excluded, but not when they were added. Saitz, 2010 reviewed 16 studies, of which 14 excluded patients with severe drinking problems. Neither of the two studies without such exclusions showed a significant effect of the brief intervention. While not definitive, this literature suggests that patients with more severe drinking problems need more extensive intervention.

Concerned that many heavy drinkers in HIV primary care would need more than brief intervention, yet mindful of limited staff time and resources in such settings, we developed a technology-based enhancement for brief drinking-reduction intervention called HealthCall (Hasin et al., 2013). HealthCall, introduced to patients at the end of a brief intervention session, consists of two main components. *Component 1* is self-monitoring, intended to increase self-awareness. During 60 days of HealthCall participation, patients engage in daily 2–4 minute calls to answer automated questions about their drinking, mood, and other HIV and general health behaviors. The calls provide greetings and positive reinforcement for participation (“we’re glad you called”). Call self-monitoring data goes into the HealthCall database. *Component 2* offers personalized feedback based on the patient’s daily self-monitoring data, delivered in a brief (10–15 min) meeting with a counselor at 30- and 60-

day visits. This personalized feedback is delivered in a bar graph summarizing the patient's reported daily drinking for the past 30 days, and a summary of the other health related information reported on the calls. In this meeting, counselor and patient review the feedback to identify patterns of drinking, mood, and behaviors that can help plan maintaining improvement, and further change efforts. Counselors also reinforce positive behaviors such as reduced drinking and change efforts.

In a randomized trial of 258 HIV patients identified through screening as heavy drinkers, we studied HealthCall as an enhancement of brief (20–25 min) Motivational Interviewing (MI; Miller and Rose, 2009). The trial had three arms: HealthCall+MI, MI-only, and time-matched educational control. About half of the patients (48.4%) met criteria for current DSM-IV alcohol dependence. By 60 days, mean drinks per drinking day decreased considerably across the sample, with significantly greater drinking reduction among patients in MI+HealthCall than in MI-only or control. Pre-specified subset analysis indicated that the benefits of MI+HealthCall over MI-only or control were found entirely within the alcohol dependent patients (Hasin et al., 2013).

To better understand the results of this trial, we now incorporate an additional variable, patients' commitment to change (Amrhein et al., 2003). Strength of commitment to change is reflected in patient language during the treatment session (also known as "change talk" (Miller and Rose, 2009; Moyers et al., 2009) or "commitment language" (Amrhein et al., 2003)). Commitment strength, scored systematically from recordings of treatment sessions, grows out of a theoretical rationale (Miller and Rollnick, 2002) and is considered a promising aspect of the treatment process in explaining outcome (Apodaca and Longabaugh, 2009). Albeit with some exceptions (Baer et al., 2008; Gaume et al., 2008, 2013, Walker et al., 2011), commitment strength predicts treatment outcomes in studies of alcohol (Amrhein et al., 2003; Gaume et al., 2008; Vader et al., 2010; Moyers et al., 2007, 2009; Morgenstern et al., 2012; Daepfen et al., 2007; Bertholet et al., 2010) gambling (Hodgins et al., 2009); cocaine (Aharonovich et al. 2008) and dietary change (Pirlott et al., 2012). A study using fMRI provided preliminary findings about biological mechanisms of commitment strength effects (Feldstein Ewing et al., 2011). Given this background, commitment strength can be viewed as an important focus of research in understanding mechanisms of change in behavioral treatment. An early, theoretically-based hypothesis that commitment strength in the latter part of the session would be most predictive of outcome (Amrhein et al., 2003) has found mixed support (Aharonovich et al., 2008; Hodgins et al., 2009; Bertholet et al., 2010) warranting further investigation. However, despite the size of this literature, commitment strength has never been investigated in an HIV population.

We, therefore, addressed two questions about outcomes in the HealthCall randomized trial in the HIV primary care patients. First, we examined whether commitment strength predicted treatment outcome (drinking reduction). This was necessary before incorporating commitment strength into a more comprehensive analysis to better understand the results of our trial. Second, we examined whether MI+HealthCall vs. MI-only status modified the relationship between commitment strength and end-of-treatment drinking reduction, and whether this effect differed between patients with and without alcohol dependence.

2. METHODS

2.1 Procedure, setting, participants

Data for this study came from a large randomized trial (N=258) of brief interventions to reduce drinking, described elsewhere (Hasin et al., 2013). Participants were recruited via staff referrals from a large hospital-based HIV primary care clinic in New York City. All patients were prescreened to identify those who had at least one day of 4 drinks within the

30 days prior to baseline, spoke English or Spanish, and were HIV-positive. Exclusion criteria included: active psychosis, suicidality, gross cognitive impairment, or plans to leave the greater New York metropolitan area within the study period. Clinic staff referred patients to bilingual study counselors for eligibility assessment, written informed consent, and all baseline study assessments. Eligible participants were consecutively enrolled and randomly assigned to advice/education control, MI-only, or MI+HealthCall between August, 2007 and May, 2010. All study procedures were in English or Spanish (as per patient's preference). Participant compensations were gift certificates (\$20) for baseline, 30 and 60-day assessments. Institutional review boards at Columbia University/New York State Psychiatric Institute, St. Vincent's Hospital, and Mt. Sinai Medical Center approved all study procedures.

The 258 patients were randomized to one of the three arms (MI+HealthCall, N=88; MI-only, N=82; Control, N=88). Of these, 4 were withdrawn, all from the MI+HealthCall arm, leaving 84 in this arm. As previously reported, participants in the three arms did not differ on a large number of patient characteristics, indicating that randomization was successful (Hasin et al., 2013). For the present report, we analyzed only participants in the MI arms (MI+HealthCall or MI-only) because a patient language scoring system does not exist for the control condition (patients told they were drinking more than advisable for their health and asked to view an HIV health education DVD with no alcohol content). Excluding control patients from the present analysis did not affect generalizability because randomization was successful. We included patients in the present analysis for whom end-of-treatment data were available (78/82 in MI-only; 75/84 in MI+HealthCall). Availability of end-of-treatment data did not differ by patient characteristics (Hasin et al., 2013). Of patients in the MI arms, those included in the present analysis were those with audible recordings of the MI session: 91.0% (n=71) of the MI-only participants and 90.7% (n=68) of the MI+HealthCall participants.

2.1.1 MI-only and MI+HealthCall treatment groups

MI-only: At treatment entry, a study counselor delivered a brief MI. This consisted of a 20–25 minute individual session, in which counselors used standard empathic MI style and techniques (e.g., use of open questions, affirmations, reflections, rolling with resistance, encouraging patients to set a feasible drinking-reduction goal (Miller and Rose, 2009) for the first 30 days. At the 30 and 60-day visits, drinking behaviors and goals were briefly discussed for 10–15 minutes. At the 30-day visit, patients were offered the opportunity to set a new drinking goal for the next 30 days.

MI+HealthCall: Patients received the same MI procedure described above. At the end of the MI session, a study counselor explained the purpose and use of HealthCall, had the patient try using HealthCall to ensure that the instructions were clear, and asked the patient to call daily for 30 days (for details, see Hasin et al., 2013). At the 30-day visit (10–15 min), counselor and patient reviewed and discussed the personalized feedback generated from the HealthCall IVR database as described above: a bar graph showing drinking (days and amount) and a summary of other patient self-monitoring information (e.g., number of days met drinking goal, reasons for drinking or not drinking). The patient was then asked to continue calling HealthCall daily for the next 30 days.

MI training and fidelity: Study counselors were trained and supervised in MI techniques by a certified MI Network Trainer. For supervision purposes, nearly two-thirds (64.7%) of all MI sessions were rated using standardized fidelity ratings (Moyers et al., 2005). MITI ratings were available for 91 patients (65.5%) of those included in the present analysis. These ratings showed acceptable to excellent fidelity in seven domains: % open questions,

64.8 (s.d., 17.2); % simple reflections 49.5 (s.d., 16.6); % complex reflections 50.5 (s.d., 16.6); reflection/question ratio 1.1 (s.d., 0.6); MI spirit 4.7 (s.d., 0.7); empathy 4.7 (s.d., 0.6) # of MI-non adherence statements 0.6 (s.d., 0.9); with an eighth domain, %MIA 68.0 (s.d., 36.4) slightly below proficiency level (.80). The mean session length was 21.7 (s.d., 9.3).

2.2 Measures

Patient assessments—Self-administered computerized assessments were completed prior to randomization, and immediately prior to the 30- and 60-day counselor meetings (patients were informed that MI study counselors and clinic staff were blinded to the self-assessment data). Alcohol dependence was assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS), a reliable and valid instrument (Canino et al., 1999; Grant et al., 2003, 1995; Hasin et al., 1997, 2007) that assesses dependence symptoms from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). Alcohol consumption was assessed at all study timepoints via 30-day TimeLine FollowBack (TLFB; Sobell and Sobell, 1995). If patients missed an assessment but returned for subsequent assessments, a retrospective TLFB was administered covering the missed time periods.

Outcome variable—The primary study outcome, mean number of drinks per drinking day during the prior 30 days (NumDD) at end-of-treatment, was created using TLFB data. Breathalyzer assessments were consistent with TLFBs.

Commitment language coding system—The level of commitment to change drinking during recorded MI sessions was coded by rating patients' language, using the procedures described by Amrhein et al. (Amrhein et al., 2003). Two independent coders (trained research technicians) blinded to random assignment to HealthCall or not and patient characteristics (e.g., drinking levels, diagnosis, treatment outcome) coded patient statements in the MI sessions, first dividing the sessions into deciles by temporal length (minutes and seconds) and then scoring statements for commitment language strength within deciles, yielding a commitment strength score for each decile. In the present sample, inter-rater reliability on these scores (intra-class correlation coefficient) was .70, indicating very good reliability, consistent with previous reports (Aharonovich et al., 2008; Amrhein et al., 2003; Morgenstern et al., 2012).

Commitment strength scores as predictor of outcome—For the present study, three commitment strength variables were created. One indicated the mean commitment strength score averaged across all 10 deciles of the MI session. A second indicated the mean commitment strength score averaged across the first half of the session (deciles 1–5). A third indicated the mean commitment strength score averaged across the second half of the session (deciles 6–10). Scores could range from –5 to +5, with higher scores indicating stronger commitment to change.

2.3 Analysis

Demographic and alcohol-related variables were examined descriptively. We then used negative binomial regression models to address the research questions, with mean drinks per drinking day as the outcome. This model was selected because it corresponds to the distribution of the drinking outcome variable (Horton et al., 2007). All regression models were adjusted for baseline number of drinks per drinking day, age, sex, and race. First, among all 139 patients, we ran models with commitment strength as a main effect (averaged across all deciles, across deciles in the first half of the session, and across deciles in the second half of the session), to test the effect of commitment strength on drinking outcome. We next ran a model that included a three-way interaction of treatment condition (MI-only

vs. MI+HealthCall), commitment strength, and alcohol dependence. Based on the results of this model, we then subset the sample into alcohol-dependent and non-dependent patients, and tested models with interactions of treatment group and commitment strength within these groups.

3. RESULTS

Sample characteristics are shown in Table 1. The MI-only and MI+HealthCall treatment groups did not differ significantly on demographic or diagnostic characteristics, consistent with successful randomization. In the sample overall, mean baseline drinks per drinking day was 6.8 (6.6 in the MI-only group; 6.9 in the MI+HealthCall group). This dropped to 2.8 at end-of-treatment (2.9 in MI-only; 2.7 in MI+HealthCall). Among alcohol dependent patients, mean baseline drinks per drinking day was 7.4 (7.7 in MI-only; 7.2 in MI+HealthCall). This dropped to 3.3 at end-of-treatment (3.5 in MI-only; 3.1 in MI+HealthCall). Among non-alcohol dependent patients, mean baseline drinks per drinking day was 6.2 (5.8 in MI-only; 6.7 in MI+HealthCall). This dropped to 2.4 at end-of-treatment (2.4 in MI-only; 2.3 in MI+HealthCall). The range of commitment strength scores was -0.93 to 3.06; the median score was 1.26, similar to other samples (Aharonovich et al., 2008; Amrhein et al., 2003). Baseline commitment strength did not differ between the two treatment groups.

3.1 Commitment strength and mean drinks per drinking day at end of treatment

In the full sample (N=139), the negative binomial model showed a significant effect of full-session mean commitment strength on mean drinks per drinking day at the end of treatment ($p=.002$). When the first-half and second-half mean commitment strength scores were tested individually, the first-half score did not predict mean end-of-treatment drinks per drinking day ($p=0.15$), while the second-half mean commitment strength score was a significant predictor (Table 2; $p=.0005$). Given these results, all further analyses were conducted using the mean commitment strength score from the second half of the session (deciles 6–10). As commitment strength increased, drinking at end-of-treatment (60 days) decreased, with drinking decreasing by 28% for each unit increase in commitment strength.

3.2 Interaction of commitment strength, treatment and alcohol dependence effects on mean drinks per drinking day at end of treatment

The negative binomial regression model showed that the three-way interaction between commitment strength, treatment group, and alcohol dependence was significant (Table 2; $p=.01$). This interaction indicated that the effect of commitment strength on mean drinks per drinking day differed between the treatment groups and between patients with and without alcohol dependence. Given that, and our previous findings that patients with and without alcohol dependence differed in their response to the treatments (Hasin et al., 2013), we divided the sample into patients with (N=65) and without (N=74) alcohol dependence and conducted remaining analyses within these subsets.

3.3 Alcohol dependent patients

The interaction of treatment (MI vs MI+HealthCall) by commitment strength was significant in predicting end-of-treatment mean drinks per drinking day (Table 2: $p=.006$). Specifically, the interaction indicates that the effect of treatment group on the drinking outcome differed by level of commitment strength. As shown in Figure 1, among alcohol dependent patients with low commitment strength during the latter part of their MI session (i.e., those below the median score for commitment strength), patients in MI+HealthCall had significantly lower mean drinks per drinking day (3.5 drinks) than patients in MI-only (4.6 drinks), a difference of 1.1 drinks. However, among patients with higher commitment strength during the latter

part of their MI session, treatment effects did not differ significantly; mean drinks per drinking day at the end of treatment was 2.4 for those in MI-only and 2.7 for those in MI+Healthcall, a difference of only .3 drinks between the groups.

3.4 Non-dependent Patients

Among patients without alcohol dependence, there was no significant interaction between treatment and commitment strength in predicting mean drinks per drinking day at the end of treatment (Table 2; $p=.39$). In addition, an exploratory analysis indicated that there was no significant main effect of commitment strength in predicting mean drinks per drinking day at end of treatment ($F=2.03$, Num df = 1, Den df = 67, $p = 0.20$).

4. DISCUSSION

In this study, we used an evidence-based element of the change process, patient commitment to change, to better understand the results of a randomized trial of brief drinking reduction in heavy-drinking HIV primary care patients. We began by showing that overall, patients' commitment to change at the end of a brief MI session predicted end-of-treatment drinking outcomes 60 days later. After finding such a relationship, we incorporated commitment strength into further analyses of the outcomes, addressing the treatment patients received and whether they were alcohol dependent or not. We showed that among alcohol dependent patients with *high* commitment to change, drinking decreased similarly in patients regardless of whether their treatment was enhanced by HealthCall participation or not. However, importantly, among alcohol dependent patients who had *low* commitment to change at the end of their MI session, study findings suggested that drinking reduction was significantly greater among those whose MI session was enhanced by HealthCall participation.

Given the previous literature on the relationship of commitment strength to treatment outcome, we predicted a similar result in the present sample. Our finding overall was that the stronger patients' level of commitment to change in their MI session, the greater their drinking reduction by the end of treatment 60 days later. This is the first time, to our knowledge, that this relationship has been demonstrated in heavily-drinking HIV patients.

While the role we found for commitment strength in predicting outcome is consistent with the literature, a novel and important finding is that commitment strength was a significant predictor of drinking outcome only among patients with alcohol dependence, but not for heavy drinkers that did not meet criteria for alcohol dependence. Among non-dependent heavy drinkers in health settings, a wide variety of brief interventions are effective for drinking reduction, including brief advice (Babor et al., 2007; Saitz, 2010; Whitlock et al., 2004a, 2004b). Such patients may simply accept and act on information and suggestions given in the intervention without the need for much discussion on their part, including statements about commitment to change. On the other hand, for alcohol dependent patients, drinking reduction is likely to be more difficult, and so for these patients a successful MI would ordinarily end with patient language indicating some commitment to change. Our study is the first to investigate this issue; the finding warrants replication in future studies.

Perhaps the most clinically relevant and important study finding was that among alcohol dependent patients who ended their MI session with low commitment strength, those in the MI+HealthCall group drank significantly less at the end of treatment than those in MI-only. Thus, adding HealthCall to MI appeared to compensate for low strength of commitment to change during the later part of the MI session. There are several possible ways this could have occurred. First, in Component 1 of HealthCall, the daily self-monitoring may have led to greater patient self-awareness of drinking, the realization of which may have increased post-MI patient efforts to cut down. Second, the daily HealthCall calls reinforced positive

patient behaviors such as calling and participation, with positive, encouraging greetings (“we’re glad to hear from you”) and signoffs (“we look forward to hearing from you tomorrow”). This repeated reinforcing process may have increased motivation and commitment from the level achieved by the end of the MI session. Third, in Component 2 of HealthCall, the 30-day review and discussion of the personalized feedback (graph and summaries) with the counselor appeared to function as an important transition point, since it further increased self-awareness (Aharonovich et al., 2006) and provided a basis for reinforcement and planning using information patients provided daily, rather than their retrospective recall of the prior 30 days (the basis for discussion in MI-only). The sharpest group differences occurred after the 30-day point (Hasin et al., 2013), suggesting that the basis of the discussion (HealthCall data vs. retrospective recall) had an impact on its outcome. Fourth, on abstinent days, HealthCall asked patients a short set of questions about their reasons for not drinking. These questions were designed, in part, to increase feelings of self-efficacy, the rewarding effects of which may also have helped overcome initial lack of commitment to change.

To assess the study outcomes, we used a confidential, self-administered format, Audio-Computer Assisted Self-Interview (A-CASI) specifically to reduce the possibility of biased reporting. (Note that IVR drinking measures were not analyzed as study outcomes, since only patients in MI+ HealthCall participated these measures, which were part of their treatment). Prior to commencing the study, we considered the possibility that brief daily reporting of drinking to HealthCall would result in *better* drinking recall (therefore higher A-CASI-reported drinking outcomes) in MI+HealthCall patients than in MI-only patients. (Differential accuracy of reported outcomes by treatment group is an inherent issue in any randomized trial comparing self-monitoring to other conditions.) If that occurred, then lower drinking reports due to worse recall in MI-only patients would have *minimized* differences between MI+HealthCall and MI-only groups relative to their actual drinking, potentially obscuring actual differences between MI+HealthCall and the other conditions. However, since we found lower end-of-treatment drinking in the MI+HealthCall group despite this potential for differential reporting in the two groups, the conclusion of beneficial treatment effects for HealthCall is supported.

Limitations of the study are noted. First, the sample consisted largely of disadvantaged minority HIV primary care patients. While these comprise a large proportion of those affected by HIV in the United States, generalizeability would have been greater if a wider socioeconomic and diagnostic range of patients had been included. Future studies should aim for a more diverse range of patients. Second, the study was conducted at one clinic only. Replication is needed in additional settings. Third, directly testing specific mechanisms of the benefit of HealthCall among alcohol dependent patients with initial low commitment strength is important and was not possible in this study. Future studies should include pre- and post-treatment measures of commitment strength and other potential mechanisms, and test mediation directly. Fourth, the drinking inclusion criterion (4 or more drinks at least once in the prior 30 days) was slightly lower than the standard risk threshold for men (5 or more drinks per occasion; National Institute on Alcohol Abuse and Alcoholism, 2005), although it matches the risk threshold for women. The rationale for this slightly lower threshold for men was that all participants in treatment for HIV, so all were ill with a potentially life-threatening condition whose prognosis for morbidity and mortality is considerably worsened by heavy drinking. The rationale for a single threshold for men and women was that this would be easier for clinical staff to remember. The findings might have been different in a heavier drinking, non-dependent group of HIV patients, although the higher the drinking level, the more likely individuals are to be dependent and hence, the less generalizeable the group of very heavily drinking, non-dependent patients. These issues should be addressed in future studies. Fifth, the sample size of the alcohol dependents

patients was small for testing a three-way interaction. Replication is needed in a larger sample.

These limitations are counterbalanced by several strengths. We utilized widely used alcohol measures with good reliability and validity. Our measures of patient commitment strength, rated from session recordings, had high inter-rater reliability. The study had excellent patient retention. Carefully trained and supervised counselors administered Motivational Interview sessions. These counselors were experienced HIV health educators who achieved good fidelity to MI procedures (Hasin et al., 2013). The regression models were carefully selected after examining the distribution of the outcome variable. The high proportion of patients available for this analysis from the original sample supports generalizability. Finally, the study had numerous novel aspects, including research in a heavily-drinking HIV sample, and examination of how differences in treatment conditions modified the effects of commitment strength, a question that has not been examined previously.

In summary, this paper contributes important information to our understanding of heavy drinking and how to reduce it in HIV patients, all of them ill and many of them likely to suffer direct effects on their survival from heavy drinking. We found that among alcohol dependent patients, HealthCall appeared most beneficial when commitment strength was lower at the end of the MI session. This suggests that HealthCall does not merely extend the effects of brief intervention, but adds effects of its own that compensate for low commitment strength after a brief MI. If so, then HealthCall effects could compensate for an even briefer intervention requiring less skill, training, and supervision than MI. The advantage of pairing HealthCall with such a briefer intervention would be to increase the dissemination potential of the intervention package (brief intervention + HealthCall). This should be investigated in future studies.

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Figure 1.

Differences in mean drinks per drinking day at the end of treatment (60 days) among alcohol dependent patients in HIV primary care (N=65), by treatment group (MI vs MI+HealthCall) and commitment strength level (High vs Low, dichotomized at the median). Commitment strength levels were coded from taped MI sessions.

Table 1

Patient Baseline Characteristics: HIV heavy-drinking primary care patients

	MI-Only (N=71)	MI+HealthCall (N=68)	Combined Sample (N=139)	
	(%)			P value
Gender (Female)	22.5	23.5	23.0	.89
Ethnicity				
African American	50.7	47.1	48.9	.83
Hispanic	43.7	48.5	46.0	
Other	5.6	4.4	5.0	
Language (Spanish)	21.1	22.1	21.6	.89
Education (High School)	56.3	51.5	54.0	.56
Married / stable relationship	14.1	14.7	14.4	.92
Employed	9.9	16.2	13.0	.27
Alcohol dependence	43.7	50.0	46.8	.45
	Mean (sd)			
Age, years	46.5 (8.3)	46.1 (8.1)	46.3 (8.2)	.58
Years since HIV diagnosis	12.0 (7.8)	13.0 (7.4)	12.5 (7.6)	.40
Baseline Mean drinks per drinking day past 30 days	6.6 (4.0)	6.9 (3.5)	6.8 (3.8)	.23
Commitment Strength Score*	1.1 (.96)	1.3 (.81)	1.2 (.89)	.25

* Note: Commitment strength score >0 indicates change in positive direction (greater commitment to change). Range of possible scores -5 to +5

Table 2

Effects of treatment and commitment strength on drinking at end-of-treatment (60 days): Heavy-drinking HIV primary care patients

Model*	Overall Model Significance	
	$F(df_{Num}, df_{Den})$	p-value
Main Effect of Commitment Strength, full sample (N=139)	$F(1,132) = 12.7$	0.0005
Interaction of Treatment $\times$ Commitment Strength $\times$ Alcohol Dependence (N=139)	$F(1,126) = 6.34$	0.01
Interaction of Treatment $\times$ Commitment Strength		
Among alcohol dependent patients (N=65)	$F(1,56) = 8.22$	0.006
Among non-alcohol dependent patients (N=74)	$F(1,65) = 0.74$	0.39

* All regression models adjusted for baseline number of drinks per drinking day, age, sex, race

Num = Numerator

Den = Denominator