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ORIGINAL ARTICLE

Efficacy of the telephone-based Brief Motivational Intervention for alcohol problems in Brazil

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Background: The Brief Motivational Intervention (BMI) is an effective treatment for alcohol misuse but has not been adequately tested for use in helplines for alcoholics. The main objective of this study was to evaluate the efficacy of a telephone-based BMI for Brazilians seeking help with alcohol use cessation.
Methods: A randomized, controlled trial was performed with Brazilian subjects. Participants were randomly assigned to either the minimal intervention group (i.e., given reference materials) or the BMI group. Alcohol abstinence was evaluated in a 6-month follow-up telephone counseling session. The analysis was based on the intention to treat (ITT).
Results: Of the 5,896 drug users who called the helpline, 700 (12%) used alcohol, 637 of whom enrolled in this study. At 6-month follow-up, 70% of the BMI group had stopped consuming alcohol compared to 41% in the control group (odds ratio = 1.5; 95% confidence interval = 1.2-1.9; p = 0.001).
Conclusions: A helpline-based BMI helps alcohol users achieve abstinence.

Keywords: Alcoholism; motivation; telephone

Introduction

Because of the enormous consequences of alcohol misuse on the health and welfare of those afflicted, their families and society,[1] there is a need to identify practical methods by which healthcare providers can help patients reduce their consumption of alcohol or quit altogether.[2] The Brief Motivational Intervention (BMI) is a successful and cost-effective treatment for reducing the health and social problems that result from excessive drinking.[3,4]

A recent meta-analysis of 22 relevant studies demonstrated that the BMI reduced excessive drinking.[4] Rollnick et al. developed the BMI for non-specialists who have the opportunity to motivate change in people who abuse substances.[5] This intervention incorporates the key principles and techniques of motivational interviews as well as a set of topic-based strategies to help general practitioners apply it.[6]

Despite the potential benefits of continuing care, many individuals with alcohol problems do not attend such programs or stop attending after relatively few sessions. Because of the chronic nature of alcohol dependence, some types of continuing care are usually recommended.[7] Continuing care protocols provided through different means, including the telephone, are more flexible and less burdensome than traditional face-to-face counseling sessions. This treatment might be more attractive to patients and therefore promote better adherence.[8] Telephone counseling for alcohol problems could help overcome barriers that often hinder access to conventional alcohol treatment.[9]

Studies that have evaluated the benefits of telephone care over primary care with regard to other addictions, such as smoking, demonstrate that the former approach increases the use of behavioral and pharmacologic assistance and leads to a higher cessation rate compared with the latter intervention.[10] A meta-analysis evaluating the effect of proactive and reactive telephone support designed to help smokers quit revealed that telephone "quitlines" provide important support for smokers. Call-back counseling enhances the usefulness of this support.[11] Telephone-based monitoring and aftercare protocols have also been evaluated to treat alcoholism, mostly with favorable results[12]; however, few studies have evaluated a telephone-based BMI for alcohol disorders. Mckay et al. compared the effectiveness of a 3-month, telephone-based continuing care intervention vs. cognitive-behavioral relapse prevention and group counseling with a two-step focus.[12]

The current paper reports on the 6-month alcohol consumption outcomes of an ongoing randomized controlled trial of telephone-based BMI. To the best of our knowledge, this is the first study of telephone-based BMI for alcohol problems in Brazil. These baseline data will be useful for comparisons with those of future long-term follow-up investigations and those of other countries. The main objective was to evaluate the efficacy of the study treatment in a population seeking help from a telephone

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information service for alcohol use cessation. We hypothesized that there would be a higher alcohol use cessation rate in the intervention group at the 6-month follow-up call compared to controls who received written advice only.

Methods

This trial was randomized and controlled. After an initial assessment using a baseline interview, the enrollees were randomly assigned to intervention and control groups. Group allocation was performed using a Microsoft® software application that applied a random number technique. The BMI group received self-help material through the mail as well as a 20-minute first BMI session[13] along with the questionnaire (total duration, approximately 30 minutes). The control group clients had their questions answered and the necessary advice provided in the usual way, with no demonstration of empathy and no room for discussion, unlike in the motivational interview. Controls also received self-help material and interviews using a closed-ended questionnaire, which took the same amount of time as the BMI interviews. The self-help material included two booklets, which consisted of 40 full-color pages that discussed the stages of change as well as the behavioral and cognitive aspects of alcohol cessation. This trial was conducted in Brazil from October 2005 to November 2006 at the Serviço Nacional de Orientações e Informações sobre Prevenção do Uso de Drogas (VIVAVOZ), a free telephone counseling call center that provides advice and support to drug users and their families.

All participants were screened during their first call to the helpline. Participants included self-reported alcohol users from all areas of Brazil who had consumed a drink in the last 30 days as well as those who called VIVAVOZ to stop drinking or those whose interventionist identified their problem and expressed a desire for them to participate in the study. Individuals who could not answer the interventionists' questions because of cognitive difficulties or the effect of alcohol or other drugs were excluded from this study, as were those who could not be contacted for the follow-up interview.

The screening instruments included a questionnaire of sociodemographic information (e.g., gender, age, education, marital status, and family income) and the National Household Survey on Drug Abuse (NHSDA) to assess the use of alcohol.[2] The latter instrument was chosen because it is used in a drug use census in Brazil. This questionnaire includes a simplification of the criteria for drug dependence adapted from the Diagnostic and Statistical Manual of Mental Disorders, Third Revision (DSM-III-R). The Substance Abuse and Mental Health Services Administration (SAMHSA) uses only six of the DSM-III-R symptoms; a positive response on three or more of these items denotes drug dependence. These symptoms are that the subjects: a) required a significant amount of time to obtain drugs, use them or recover from their effects; b) used a greater amount or a greater frequency of drugs than intended; c) increased their drug tolerance; d) increased the amount of activities with physical risk under the effect of drugs or soon after the effect of the drugs; e) increased their number of personal problems; and f) wanted to reduce or to stop their use of a specific drug. Finally, the Contemplation Ladder was used as a continuous measure of the client's readiness to change their drinking behavior.[14] The Contemplation Ladder is a visual analog composed of 11 rungs and 5 anchors that represent the stages of change. Furthermore, this assessment is a brief measure that allows individuals to indicate their motivation to change their behavior from 1 to 10 in which 1 denotes the least motivated and 10 denotes the most motivated.

Thirty university students drawn from health programs and trained to administer the questionnaires and the BMI collected the data. The training model used was adapted from the Medical Education Model for the Prevention and Treatment of Alcohol Use Disorders. This interdisciplinary training model is based on the following educational principles: a) the repetition and reinforcement of major ideas, themes, and skills; b) group integration and linking of ideas throughout the course; c) continuous supervision; d) learner-centered teaching strategies; e) initial skill-based, small-group practice sessions that utilize role-playing and simulated or real cases; f) additional practice sessions in the call center under close supervision; and g) periodic testing and feedback.[15]

Experienced substance abuse educators and drug abuse researchers with experience in the methods administered this 5-day, 40-hour training program. The counselors completed a written test in which a passing score was 7.0 or above. Next, they participated in a 5-day, 20-hour training program on motivational interviewing and the BMI.[5] Finally, the counselors were trained on computer and telephone operations as well as customer service skills at the call center under the supervision of graduate students who were pursuing master's and doctoral degrees. The final phase of training involved all of the themes presented during the previous two courses. These discussions primarily focused on alcohol and other drug abuse as well as the use of the BMI in real-life situations (i.e., role playing) based on cases enrolled through the call center. Counselors were also trained with regard to telephone use, software programs, Internet access and reactive customer service. To ensure the quality and standardization of the care provided, the counselors used a standard flowchart for the BMI group and another appropriate flowchart for the control group. Furthermore, the counselors were evaluated monthly. The supervisors rigorously applied the Behavior Change Counseling Index (BECCI)[16] and the competencies checklist (empathy, ethics, listening, verbal communication, and problem resolution) to evaluate the interview skills of counselors. The counselors received continuous feedback regarding their performance. A score of 80% or higher was the objective of this continuous call center training.[17]

After completing the first session, a letter containing the support material and confirming the dates of the

subsequent calls (1, 3, and 7 days as well as 1, 2, 3 and 6 months after the self-established alcohol cessation date) was sent to each participant by mail. Control and BMI participants received the same letter. Both groups were supposed to call the center on each of the seven dates. If the call was not received, proactive contact with the patient was established. All calls were made with the same control or BMI structure in accordance with the designated group. Calls after the alcohol cessation date were used for clinical intervention using the control procedures or motivational procedures, according to group allocation, and for collection of follow-up data. During the follow-up calls, the questionnaires used in the initial screening were administered to provide participants with relapse prevention techniques if needed. Clients were considered lost to follow-up when contact by telephone or mail could not be established after five attempts. The study attrition rate was 76.9% (490 participants dropped out). Counselors were blinded to the collection of follow-up data by a random assignment that used scripts to guide the telephone interviews. Figure 1 summarizes the study protocol.

Selection of alcohol users was reactive (i.e., users called the VIVAVOZ hotline). When participants did not follow up with the call center, six research assistants selected from within the counseling team were asked to proactively call these individuals. These calls originated at the call center followed the same principles established for control and intervention through reactive calls. Both the control and intervention groups (93%) received this proactive call in one or more designated dates.

The sample size was calculated assuming that alcohol cessation rates in the control and BMI groups would be 40 and 60%, respectively.[13] A sample size estimation with a statistical significance of 5% and a power of 80% suggested that 69 individuals were needed in each group at 6-month of follow-up. Since most 6-month follow-up studies with alcohol dependents show a 15 to 25% retention rate, more individuals were planned to be included at the beginning of the study to make up for this difference.

The main parameter analyzed was alcohol abstinence, which was defined as complete avoidance of any alcohol consumption. A descriptive analysis of the variables was performed using the intention-to-treat (ITT) principle. This was followed by a bivariate analysis that compared categorical variables using the chi-square test with calculation of odds ratios (ORs) and 95% confidence intervals (95%CI). P-values < 0.05 were considered statistically significant. All variables presenting p-values < 0.20 on bivariate analysis were included in a logistic regression model (gender, age, education, marital status, family income, type of drug intake, alcohol dependence, as well as stage of change and treatment). The Cox proportional hazards model established the alcohol abstinence survival rate in the BMI and control groups at the 6-month follow-up period after adopting per-protocol analysis. The Statistical Package for the Social Sciences (SPSS), version 12.0, was used to perform all statistical procedures.

This study was approved by the Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA) Ethics Committee (protocol no. 019/05).

Results

Figure 1 summarizes the participant identification, recruitment, random allocation, and follow-up stages of the study. We identified 5,896 VIVAVOZ callers, only 700 (12%) of whom met the alcohol use criteria for inclusion in this study; 63 callers were excluded at the screening stage. The reasons for participation refusal included ''no interest'' and ''did not have alcohol in the past 30 days''. The remaining 637 participants were randomly assigned to either the BMI (n=293) or control groups (n=344). Among these 637 participants, 141 BMI and 154 control individuals were excluded from the analysis because they could not be contacted. As illustrated in Figure 1, the response rates were equal for both groups at the 6-month follow-up call (23%). Thus, there was no between-group difference in the proportion of adherence to the follow-up call.

Table 1 summarizes and compares the sociodemographic characteristics of the enrolled participants by group. Of the entire sample, 71% reported using alcohol with illicit drugs, 78% had used alcohol for over 5 years, 84% were dependent on alcohol and 69% were in a preparation/action stage. The BMI and control groups were equivalent on virtually all characteristics. Sixty-five percent of all participants had not recently sought help with alcohol use cessation. No significant between-group differences were found with respect to the demographic data at baseline.

Table 2 summarizes the percentage of participants who had ceased alcohol consumption by the 6-month follow-up call (ITT analysis). Only the variables readiness to change and treatment were associated with abstinence at 6 months.

Seventy percent of the participants in the BMI group who completed the 6-month follow-up call had abstained from alcohol, compared with 41% of individuals in the control group (total study - 15% BMI vs. 10% control group); bivariate analysis revealed a significant between-group difference (OR = 1.7; 95%CI 1.0-2.7). Based on continuous abstinence time and the ITT principle, in which dropouts are considered people who relapse, a Cox proportional hazards model detected a significant difference between the BMI and control groups (OR = 1.5; 95%CI 1.2-1.9) (Figure 2). The results also indicated that three is the number of participants to be treated for a 180-day period in order for one alcohol user to cease using the drug.

Gender, marital status, family income, dependence, and stage of change were not significant predictors of alcohol use relapse on logistic regression analysis; however, when the variable treatment was included, a significant between-group difference was observed.

Most participants who were abstinent were in the preparation/action stage at the 6-month follow-up call (83%). The control group, who received the self-help

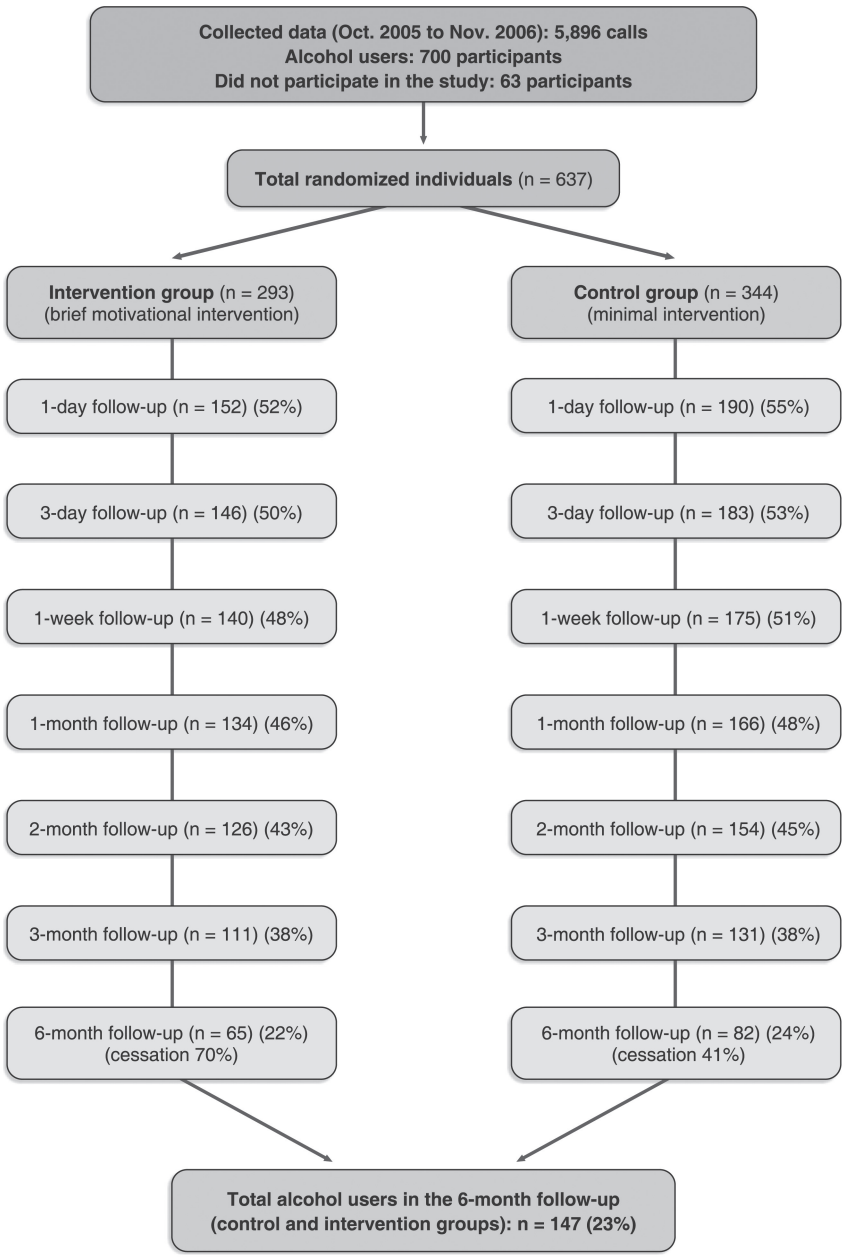


Figure 1 Flowchart of the progress presented by alcohol users over the study

material once in the previous 6 months, were 2.5 times more likely to relapse compared with the BMI group (OR = 2.4; 95%CI 1.3-4.3) (Table 2).

Discussion

This study is the first randomized trial to compare a reactive telephone-based motivational intervention with a minimal intervention (i.e., self-help material) among Brazilians recently seeking treatment for alcohol use. This trial found that a seven-session motivational intervention was more effective than written advice plus information and advice delivered in the usual way in reducing alcohol consumption at a 6-month follow-up call. This decrease in alcohol use is consistent with other studies.[13,18] McKay et al. reported that telephone-based counseling produced significantly higher rates of abstinence compared with standardized face-to-face care for patients with heavy alcohol dependence who had previously completed an intense outpatient treatment regimen.[12] Brown et al. demonstrated that a six-session telephone and mail intervention was more effective than a pamphlet alone in reducing drinking at 3 months in men who abuse and are dependent upon alcohol. The abstinence rates in the study with the outpatient alcoholics were similar to those seen in the present study, although the telephone counseling occurred weekly. Therefore, telephone-based motivational interventions might be

Table 1 Participant alcohol misuse demographics at baseline by study group, n (%)

Variables	Control	BMI	Total
Gender			
Male	238 (69)	214 (73)	425 (71)
Female	106 (31)	79 (27)	185 (29)
Total	n=344	n=293	n=637
Age (years)*	26 (20-37)	28 (22-37)	27 (21-37)
Education			
Elementary or less	200 (69)	142 (63)	342 (66)
Some high school or more	90 (31)	83 (37)	173 (34)
Total	n=290	n=225	n=515
Marital status			
Married/cohabitation	90 (30)	76 (31)	166 (30)
Separated/divorced/widowed/single	211 (70)	168 (69)	379 (70)
Total	n=301	n=244	n=545
Family income			
1-5 $\times$ MW	245 (84)	191 (84)	436 (84)
$>5 \times$ MW	47 (16)	37 (16)	84 (16)
Total	n=292	n=228	n= 520
Type of drug intake			
Alcohol only	23 (7)	21 (8)	44 (7)
Alcohol and tobacco	89 (26)	54 (18)	143 (22)
Alcohol and illicit drugs	232 (67)	218 (74)	450 (71)
Total	n=344	n=293	n=637
Years of alcohol use			
$\leqslant 5$	75 (23)	59 (21)	134 (22)
>5	257 (77)	224 (79)	481 (78)
Total	n=332	n=283	n=615
Dependence	274 (83)	233 (84)	507 (84)
Total	n=328	n=277	n=605
Stage of change			
Pre-contemplation	73 (23)	51 (19)	124 (21)
Contemplation	39 (12)	25 (9)	64 (10)
Preparation	74 (23)	72 (26)	146 (25)
Action	135 (42)	124 (46)	259 (44)
Total	n=321	n=272	n=593

Percentage of participant responses at baseline. Nonresponses are excluded.
BMI = Brief Motivational Intervention; MW = minimum wage in effect at the time of the study (R$ 545.00, about US$ 250.00).
* Median (interquartile range).
$p > 0.05$.

more effective for people addicted to alcohol when administered in sessions of six or more.[19]

According to a meta-analysis on the efficacy of brief interventions on problem drinking,[20] the majority of studies have targeted individuals with regular, hazardous consumption of alcohol but excluded individuals with alcohol dependence. Although the BMI is more acceptable to individuals with less severe drinking problems,[21] our data support its use in people with alcohol addiction. These individuals were highly motivated for treatment. Interestingly, approximately 70% of all participants included were in the preparation/action stage at baseline, and 83% of participants remained motivated after 6 months. These data indicate that motivational interviews prevent the ''backward'' move from preparation to contemplation that might be a factor that induces relapse. One possible explanation of this result is that individuals who voluntarily seek help are more ready to change than those who do not seek help.[4] DiClemente et al. examined the influence of alcohol treatment on behavior change and the role of motivation. These authors reported that patients with more severe alcohol problems generally have greater motivations for treatment.[22] Our results confirmed these findings. According to Borsari et al., the BMI is associated with increases in motivation to change alcohol use that are apparent immediately after a BMI session.[23]

Freyer-Adam et al. tested the efficacy of a brief alcohol intervention on inpatients. These authors demonstrated that the intervention had positive effects on readiness to change drinking and readiness to seek formal help for alcohol problems.[24] Borland et al. evaluated the efficacy of a proactive telephone-counseling intervention for smoking cessation compared with self-help sources alone. These authors demonstrated that helpline callers are generally motivated to quit and are actively seeking help.[25] Although the stage of change variable did not significantly predict alcohol cessation in our study, this finding is relevant because it demonstrates that the BMI increases or maintains individuals' readiness to change, an important premise for behavior change. Strong motives can change specific behaviors and the level of motivation has been consistently identified as an important factor in the treatment of alcohol problems.[26] Interventions that successfully enhance behavioral change motivation resolve participant ambivalence toward change and increase the likelihood of future change.[24]

Our study had 425 male and 185 female participants. As this disproportionate gender ratio suggests, alcohol

Table 2 Odds ratios for alcohol consumption abstinence on bivariate and multivariate analyses* (n=637)

	Cessation		Bivariate†		Adjusted‡	
Variables	Yes, n (%)	No, n (%)	OR (95%CI)	p-value	OR (95%CI)	p-value
Gender						
Male	51 (64)	401 (72)	1.4 (0.8-2.3)	0.08	1.4 (0.6-3.1)	0.3
Female	29 (36)	156 (28)	1	-	1	-
Age (years)						
< 35	50 (63)	398 (72)	15 (0.9-2.4)	0.06	1.0 (0.4-2.1)	0.8
⩾ 35	159 (37)	30 (28)	1	-	1	-
Education						
Elementary or less	46 (58)	296 (68)	1.5 (1.0-2.5)	0.04	1.3 (0.6-3.0)	0.4
Some high school or more	34 (42)	139 (32)	1	-	1	-
Marital status						
Married/cohabitation	24 (30)	142 (31)	1.0 (0.5-1.6)	0.5	-	-
Separated/divorced/widowed/single	55 (70)	324 (69)	1	-		
Family income						
1-5 × MW	66 (82)	370 (84)	1.1 (0.6-2.1)	0.17	1.0 (0.2-2.1)	0.5
> 5 × MW	14 (18)	70 (16)	1	1	1	-
Type of drug intake						
Alcohol and illicit drugs	31 (39)	156 (28)	1.6 (1.0-2.6)	0.03	1.0 (0.3-1.7)	0.4
Alcohol and tobacco	49 (61)	401 (72)	1	-	1	-
Dependence						
Yes	70 (87)	437 (83)	1.0 (0.3-1.4)	0.2	1 (0.2-1.6)	0.1
No	10 (13)	88 (17)	1	-	1	-
Baseline stage of change						
Pre-contemplation or contemplation	14 (17)	174 (34)	2.4 (1.3-4.3)	0.002	1.7 (0.7-3.8)	0.1
Preparation or action	66 (83)	339 (66)	1	-	1	-
Treatment						
Minimal intervention	34 (42)	310 (56)	1.7 (1.0-2.7)	0.01	2.5 (1.1-5.3)	0.01
BMI	46 (58)	247 (44)	1	-	1	-

95%CI = 95% confidence interval; BMI = Brief Motivational Intervention; ITT = intention to treat; MW = minimum wage in effect at the time of the study (R$ 545.00, about US$ 250.00); OR = odds ratio.
* Gender, age, family income, education, type of drug intake, dependence, baseline stage of change, and treatment.
† Chi-square test.
‡ Logistic regression.

problems are more prevalent among men than women; however, there was no interaction between gender and group type at the 6-month follow-up call with regard to alcohol consumption cessation. Moyer et al. argued that although no relationship between gender and treatment outcome has been reported, men and women might benefit from different types of treatments (e.g., confrontational vs. nonconfrontational brief interventions).[3] In this way, both genders manifest the same expectations for improvement and must be targeted for intervention.[27]

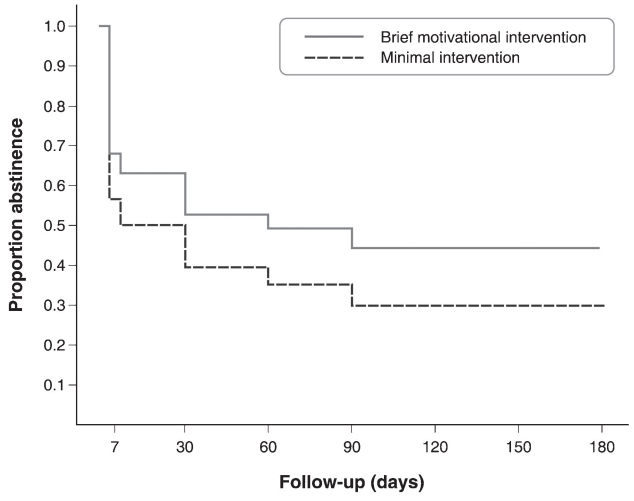


Figure 2 Cox proportional hazard for abstinence from alcohol intake (n=147) (odds ratio = 1.5; 95% confidence interval 1.2-1.9; p = 0.001)

Our findings agree with previous studies that show that alcohol use is associated with other forms of drug abuse.[28] The relationship between cigarette smoking and alcohol use is well documented.[29] Studies demonstrate that people who abuse alcohol often abuse multiple types of drugs.[30] Estimates indicate that 30-60% of alcoholics abuse cocaine, 20-50% abuse cannabis,[31] 12-20% abuse benzodiazepines[32] and 7-10% abuse heroin.[31] The NIDA reported that the majority of drug-related emergency room visits involve the combined use of alcohol and illicit drugs.[33] However, this association does not seem to be important for alcohol abstinence at 6-month follow-up.

Telephone call centers have a viable therapeutic role in monitoring and treating numerous disorders, including drug dependence. This method may be particularly effective for delivering continuing care protocols to patients who have limited access to transportation or to those with family or work-related responsibilities that preclude regular visits to substance abuse treatment clinics after an initial stabilization has been achieved.[7] Brief telephone interventions for alcohol decreased impaired driving in at-risk patients at an emergency department discharge.[34] Rates of at-risk drinking are

significantly lower among patients who receive self-help literature and telephone counseling compared with a control group.[35] Apodaca & Miller reviewed the value of self-help literature, which is often used as part of a brief alcohol intervention, in a meta-analysis.[36] These authors found that self-help materials can reduce the alcohol consumption of patients without a one-on-one consultation. Moreover, this intervention is cost-effective, given the large number of risky drinkers. Nordqvist et al. demonstrated that self-help literature might enhance motivation to change.[37] Cunningham et al. evaluated the efficacy of a self-help book for treating alcohol problems and found a significant effect of alcohol consumption among a representative sample of problem drinkers.[38] Brief counseling provided by physicians and nurses effectively reduced alcohol intake in patients who also received self-help booklets (54%) compared with those who received only the self-help booklet (39%) in a 6-month follow-up study.[39] The efficacy of the brief intervention might be partly due to an interaction between the motivational method and the self-help material.

There are several limitations to our findings. First, the sample is small because callers failed to comply with the follow-up instructions. Despite the ease of telephone contact and probably because patients had no obligation to continue giving follow-up calls, approximately only 23% completed the follow-up. In their classic review, Baekeland & Lundwal found dropout rates as high as 52-75% before the fourth treatment for alcohol abuse and dependence. Future studies should plan to verify the characteristics of dropouts in alcoholism interventions. Second, we did not use a formal system to rate the session audiotapes for adherence to the treatment manual.[40] One may speculate that the low adherence to follow-up may be linked to alcohol dependence itself, where the abstinence violation effect (AVE) occurs in individuals who have committed to abstain from using alcohol, when an initial lapse occurs and then proceeds to uncontrolled use. In future studies, temptation to use, self-efficacy to abstain, and the AVE need to be evaluated after motivational interviewing. Third, the assessment of alcohol consumption was limited to self-reports. We did not analyze biological markers (carbohydrate-deficient transferrin [CDT] or gamma-glutamyl transpeptidase [γ-GT]) or collected reports from collateral informants. However, several studies have shown that the self-report data of alcohol dependent patients are highly valid and reliable compared with toxicological blood analyses or collateral informants.[32] Fourth, we included seven sessions of feedback and advice in the 6-month follow-up intervention, which might have been different from interventions used in other studies. For example, what one study considers a brief intervention might be considered an extended intervention by another.[3] Because of this possible variation, our results are restricted to a specific population and set of treatment characteristics.

In conclusion, a telephone-based motivational intervention is an effective intervention for reducing alcohol consumption. The impact of reducing alcohol abuse in the widespread population of a country the size of Brazil might reduce the burden of alcohol disability.

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Disclosure

The authors report no conflicts of interest.

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