

Motivation and drinking-related treatment goals in alcohol use disorder

Therapeutic success in relapse prevention in alcohol use disorder: the role of treatment motivation and drinking-related treatment goals

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KEYWORDS

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ABSTRACT

Background: Changing addictive behavior is a complex process with high demands on motivation. The Transtheoretical Model of Behavior Change provides a theoretical framework for explaining and predicting behavioral change, although its predictive value for addiction is somewhat inconsistent.

Objective: The aim of the present study is to extend the Transtheoretical Model of Behavior Change by investigating not only treatment motivation but also the predictive value of the type of drinking-related treatment goal. Additional predictors, such as substance-related and sociodemographic variables, are also included in analyses seeking to predict return to drinking during relapse prevention treatment for alcohol use disorder.

Methods: In this observational study, 99 inpatients from a treatment center for alcohol use disorder were recruited. Treatment motivation was assessed in accordance with the Transtheoretical Model of Behavior Change, drinking-related treatment goal through a self-report questionnaire, and substance-related and sociodemographic variables via the clinic information system. Associations between the potential predictors and covariates were explored using stepwise logistic regression.

Results: During treatment, 42.6% of participants had at least one relapse. Scoring higher on the action dimension at admission ($OR = 0.81, p = .04$) and being employed ($OR = 0.37, p = .02$) were significant predictors of abstinence during treatment.

Conclusions: This study confirms that treatment motivation contributes to the prediction of treatment outcome, even when controlling for other variables. In future research, the underlying mechanisms of treatment motivation should be further explored.

Introduction

Alcohol use disorder (AUD) is a chronic disorder characterized by a relapsing trajectory. Data from Switzerland indicates that up to 40.0% of inpatients in abstinence-oriented inpatient treatment return to drinking during treatment,¹ and at one-year follow-up, only about 40.5% of former inpatients report continued abstinence.² Several researchers have shown that drinking during treatment is a predictor of long term alcohol misuse.^{3,4} Thus, it is important for patients to avoid drinking during treatment to ensure persistent abstinence.

In developing strategies to increase therapeutic success, researchers have investigated predictors of drinking that may be relevant. In particular, sociodemographic variables, substance-related variables, and motivational variables have been examined as potential predictors of drinking during treatment. With regard to sociodemographic variables, age and gender have been the most frequently studied variables; the partially inconsistent results are summarized in two reviews.^{5,6}

Generally speaking, female gender and greater age are associated with a higher probability of remaining abstinent. Several studies have shown that social factors such as being employed are associated with a lower risk of relapse.⁵ For substance-related variables, baseline alcohol consumption and the severity of AUD have been consistently linked to relapse in the literature:^{5,6} Greater consumption of alcohol before entering treatment and more severe forms of AUD are both associated with a higher risk of relapse during treatment. We therefore included age, gender, and employment status as well as baseline alcohol consumption and the severity of AUD as covariates in the analyses.

Regarding motivational factors, treatment motivation and the drinking-related treatment goal seem especially relevant as predictors of drinking during treatment.^{5,7} With respect to treatment motivation, the Transtheoretical Model of Behavior Change (TTM)⁸ is widely used to assess individual motivation for behavior change. The TTM is a phase model that describes an individual's readiness to change attitudes and behavior linked to a specifically defined problem behavior. In its original form, the central assumption of the model proposes that a behavior change occurs in qualitatively different, mutual exclusive, and consecutive stages ("stages of change"). In the "precontemplation" stage, individuals do not intend to change their unhealthy behavior in the near future, as they may not yet be aware of the negative consequences. In the subsequent "contemplation" stage, individuals have formed an intention and in the "preparation" stage, they prepare to take action. In the "action" stage, individuals have

changed their behavior and are still in the process of becoming healthier, while they must sustain their healthy behavior in the “maintenance” stage.

The TTM was originally developed in the 1980s, and its assumptions have been challenged and modified in the years since. The concept of mutually exclusive stages has been criticized by several researchers^{9,10} who instead propose multiple independent motivational dimensions. The TTM has been applied to a number of health problems, including smoking,¹¹ insufficient physical activity,¹² and substance abuse.¹³

In alcohol-related research, the application of the TTM has produced inconsistent results in the prediction of relapse during treatment (i.e. predictive validity). Migneault et al.¹⁴ points out the practical utility of the TTM during treatment (e.g., improved therapeutic alliance, faster progress in therapy), but also emphasizes that the model is more descriptive than predictive, yielding mixed results for its validity. Similarly, Field et al.¹⁵ could not confirm the predictive validity of the TTM for treatment outcomes in their study. However, Zhang et al.¹⁶ demonstrate that the dimension of change is related to long term alcohol use (i.e., patients scoring on the ambivalence dimension had a higher consumption of alcohol at nine-month follow up compared to patients on the action dimension). The reasons underlying these inconsistencies are still unclear and require further clarification.

Another factor that might play a considerable role in determining therapeutic success beyond an individuals' motivation for behavior change is the content of the goal.^{7,17} Although patients formally accept abstinence as the aim of abstinence-oriented relapse prevention treatment, they might have a different individual drinking-related treatment goal, such as reducing the amount or frequency of drinking.¹⁷ Berger et al.⁷ shows that patients an abstinence-oriented drinking goal benefited the most from treatment. Meyer et al.¹⁷ likewise demonstrates the effect of the individual drinking-related treatment goal on long term alcohol use: Patients with the goal of abstinence exhibited the highest abstinence rate at one-year follow-up compared to those with other drinking-related treatment goals. Thus, assessing the specific drinking-related treatment goal in addition to treatment motivation will clarify whether an individuals' goal of abstinence or reduced drinking may contribute to explaining additional variance in treatment outcomes.

Taken into consideration several decades of research on the predictors of drinking during treatment, a combination of the sociodemographic, substance-related, and motivational variables that have been

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identified may hold the greatest promise to further improve our understanding. Consequently, we tested the following hypotheses: Based on the research reported above, abstinence during treatment will be predicted by sociodemographic (gender, age, employment status) and substance-related variables (severity of alcohol dependence, baseline alcohol consumption). Furthermore, we assume that when controlling for these factors treatment motivation will additionally predict abstinence during treatment, and including drinking-related treatment goals may also improve the model's predictive power.

Methods

Study sites and treatment

In this observational study, participants were recruited from an inpatient treatment center for alcohol use disorder (Forel Clinic) in Switzerland. The preconditions for entering inpatient treatment at the clinic are (a) an age of ≥ 18 years, (b) a diagnosis of alcohol dependence according to ICD-10,¹⁸ (c) abstinence since alcohol detoxification and (d) agreement to the drinking-related treatment goal of abstinence and commitment to abide by clinic rules.

The treatment program in the Forel Clinic is characterized by voluntariness and an open-door policy. It includes psychosocial relapse prevention provided in weekly individual psychotherapy sessions, and group therapy sessions, as well as through exercise therapy, occupational therapy, and social counseling. In general, the patients all receive the same therapies, although they can choose between additional offers. Treatment duration is normally set between 8 and 12 weeks, depending on disease severity, psychiatric comorbidity, and the patients' private professional situation.

Breathalyzer tests are employed when (a) patients reenter the clinic after weekend leaves or (b) clinical staff suspect a patient has used alcohol. Additional breathalyzer tests as well as urine and blood tests are conducted in a random and unannounced manner. Drinking during treatment is not a reason for exclusion from therapy; on the contrary, in the Forel Clinic, drinking during treatment is considered a symptom of the disease and the treatment concept encompasses drinking during treatment. The aim is for the patient to learn from the experience of drinking in order to return to abstinence.

Design and procedure

The study was conducted in accordance with the Declaration of Helsinki¹⁹ and was approved by the Ethics Committee of the Canton Zurich.

The inclusion criteria for participation in the study were similar to the criteria for entering treatment (see above). Exclusion criteria were insufficient language comprehension skills to follow the staff instructions or to complete questionnaires, cognitive deficits that would limit the patient's ability to provide informed consent and, acute suicidality or schizophrenia (as assessed by the research assistant at the first appointment).

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Patients fulfilling the inclusion criteria were recruited by the research assistant within the first week of admission. After the objectives and procedures of the study were explained, patients were asked to grant their informed consent. The respondents then completed the questionnaires anonymously.

Data assessment took place between March 2014 and July 2016. During data collection, 183 patients entered into relapse prevention treatment and fulfilled the inclusion criteria. Of these 183 screened patients, 99 decided to take part in the study.

Outcome measures and instruments

The primary outcome variable involves drinking behavior during the inpatient treatment program (return to any drinking vs. status of abstinence). A patient was classified as consistently abstinent if neither the results of the breathalyzer tests nor the patient's self-reports indicated alcohol consumption during his or her stay.

The selection of predictors was guided by previous research and included sociodemographic variables such as age, gender, and employment status and substance-related variables such as baseline alcohol consumption and the severity of AUD.^{5,6} Motivational factors with a focus on treatment motivation and drinking-related treatment goals were additionally incorporated into the analyses.^{5,7}

The sociodemographic variables (age, gender, and employment status) and the severity of AUD (defined as number of ICD-10 criteria of alcohol dependence¹⁸) were gathered from the clinic information system; the other variables were measured using questionnaires.

Baseline alcohol consumption before entering treatment was assessed using the Timeline Follow Back method (TLFB)²⁰ with pencil and paper during a clinical interview conducted by the research assistant. The TLFB assesses daily drinking retrospectively with the help of a calendar. The amount of drinking and consumption pattern one month before treatment admission was registered in terms of standard drinks (one Swiss standard drink equals 33 centiliters or 11 ounces of beer, 15 centiliters is 5 oz of wine, or 4 centiliters is 1.4 ounces of spirits). The number of standard drinks per week and per drinking day were assessed, and the number of total drinks during one month before admission was calculated as a baseline score of alcohol consumption (internal consistency: $\alpha = .99$).

Treatment motivation was measured using the University of Rhode Island Change Assessment Scale (URICA),²¹ in which the subscales assess the constructs of the TTM as independent dimensions.

In this study, we used the German 16-item short form of the URICA (“Veränderungsstadien-Skala”, VSS-k) to assess the participant’s readiness to change his or her drinking behavior. The URICA’s four subscales - Precontemplation, Contemplation, Action, and Maintenance - consist of four items each, that are answered on a five-step scale from 1 (strongly disagree) to 5 (strongly agree). The German evaluation study by Fecht et al.⁹ identifies four factors (subscales), in contrast to the original 5-factor structure of the TTM. Furthermore, the authors propose use of the questionnaire as a dimensional instrument: In each stage of change, individuals may exhibit a combination of dimensions (e.g. a high value in precontemplation and at the same time a minimal expression in maintenance). Participants filled out the URICA on their own using paper and pencil. The URICA has been shown to have good psychometric properties (internal consistency in the current study: precontemplation $\alpha = .51$, contemplation $\alpha = .54$, action $\alpha = .46$, maintenance $\alpha = .66$).⁹ For the analyses in this study, the individual subscales were used. A higher score in the corresponding subscale indicates a stronger expression of the attitude; for example, a higher score on the precontemplation subscale indicates no intention to change the behavior, whereas a higher score on action means that someone is in the process of behavior change.

The drinking-related treatment goal was assessed by the individual psychotherapist at admission. Patients could choose between six different alternatives: temporally unlimited abstinence, temporally limited abstinence, controlled drinking, no restriction, not decided yet, or a different goal. For the analyses, the individual’s drinking-related treatment goal was subdivided into abstinence-oriented (e.g., temporally limited or unlimited abstinence) and drinking-oriented goals (controlled drinking, no restriction). Although the Forel Clinic’s treatment program is abstinence-oriented, other drinking-related treatment goals are acknowledged.

Data analyses

The data were screened for descriptive information and frequencies. The normality of distribution was verified using the Kolmogorov-Smirnov test. The percentage of missing values across the variables of interest varied between 0.0% and 16.8%. We used multiple imputation to create and analyze 30 multiply

imputed datasets. Incomplete variables were imputed under fully conditional specification, using the default settings of SPSS 24.²² Associations between the potential predictors and covariates were explored using stepwise logistic regression. The status of abstinence (categorical variable: return to any drinking (1) vs. status of abstinence during treatment (0)) was considered as outcome variable of the regression model. As outlined in the hypotheses, the variables were entered in two blocks: Block 1 encompassed the sociodemographic variables: age (continuous variable), gender (categorical variable: male (0), female (1)), and employment status (categorical variable: unemployed (0), employed (1)), as well as the substance-related variables: baseline alcohol consumption (continuous variable), and severity of AUD (continuous variable). Block 2 consisted of the subscales of the URICA questionnaire: precontemplation, contemplation, action, and maintenance (all continuous variables) and the drinking-related treatment goal (categorical variable: abstinence-oriented drinking goal (1) vs. drinking-oriented drinking goal (0)). We reported logits with their corresponding standard errors and 95% confidence intervals as well as odds ratios for the point estimates. All statistical analyses were two-tailed, with a significance level at $\alpha < .05$. Data were analyzed using SPSS 24.²²

Results

Participants

Overall, 99 inpatients participated in this study. The baseline sociodemographic characteristics are as follows: At admission, the mean age of the subjects was 48.0 years ($SE = 1.085$); 37.6% were female. Of the participants, 38.2% were married and 53.1% were employed. Participants met on average 5.2 ($SE = 0.14$) criteria of the 6 criteria of the ICD-10 diagnosis of alcohol dependence. A drinking-oriented treatment goal was stated by 17.3% of the participants; 82.7% expressed an abstinence-oriented goal.

Substance-related behavior

On average, study participants started drinking in a problematic way at the age of 26.6 ($SE = 1.30$). Upon admission, participants reported the number of standard drinks per day using the TLFB. On average, they consumed a mean of 8.7 standard drinks ($SE = 1.35$) per day; they drank alcohol on 5.2 ($SE = 1.89$) days per week, and per drinking day, they consumed 11.9 ($SE = 4.56$) standard drinks. During treatment, 42.6% of the subjects ($M = 0.81$, $SE = 0.12$) had at least one alcohol relapse.

Regression analysis

Status of abstinence during treatment

The results of the analyses concerning a return to drinking during treatment are presented in Table 1.

Table 1. Results of the logistic regression analysis with return to drinking during treatment as the dependent variable.

Predictors	<i>B</i>	<i>SE (B)</i>	<i>OR</i>	<i>95% CI (B)</i>	<i>p</i>
<i>Step 1</i>					
Gender (male ⁺)	-0.087	0.442	0.917	0.386 - 2.181	.845
Age ^a	-0.004	0.020	0.996	0.958 - 1.036	.851

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Employment status (unemployed ⁺) ^a	-0.999	0.440	0.368	0.155 - 0.873	.023*
Severity of alcohol dependence	0.037	0.206	1.038	0.693 - 1.556	.856
Baseline alcohol consumption	0.000	0.001	1.000	0.998 - 1.002	.975
Constant	0.245	1.507	1.277	0.066 - 24.539	.871
<i>Step 2</i>					
Drinking-related treatment goal (drinking-oriented treatment goal ⁺) ^a	-1.468	0.781	0.230	0.050 - 1.069	.061
Precontemplation ^a	-0.064	0.120	0.938	0.741 - 1.187	.595
Contemplation ^a	0.129	0.112	1.138	0.913 - 1.419	.251
Action ^a	-0.214	0.105	0.807	0.657 - 0.992	.042*
Maintenance ^a	0.005	0.084	1.005	0.853 - 1.185	.950
Constant	2.535	2.497	12.612	0.094 - 1691.485	.310

Note: ^a = at admission, ⁺ = reference group, * $p < .05$, B = regression coefficient, SE = standard error, OR = odds ratio, p = P-Value

In the regression analysis on drinking during treatment, two predictors were identified as having an impact: employment status and the action sub-scale at admission (see Table 1). Analyses show that being employed ($B = -0.99$, $p = .02$) and scoring high on the action subscale at admission ($B = -0.214$, $p = .04$) are associated with a higher probability of remaining abstinent during treatment. This means, that patients who were employed had a significantly lower odds of relapsing during treatment compared to their unemployed counterparts ($OR = 0.37$, $p = 0.02$). Moreover, patients who had a higher score on the action subscale had a significantly lower odds of relapsing during treatment compared to patients who scored low on the action subscale ($OR = 0.81$, $p = 0.04$). The model explains 31.9% of the variance (*Nagelkerke's* $R^2 = 0.319$) in the dependent variable, and 77.2% of the cases can be classified correctly. Interestingly, reporting an abstinence-oriented treatment goal at the beginning of the treatment is negatively related to drinking during treatment ($B = -1.47$, $p = .061$, see Table 1), but this effect did not reach statistical significance.

Discussion

This study's aim was to analyze the predictive value of various aspects of treatment motivation and additional predictors on return to drinking during relapse prevention treatment for alcohol use disorder.

The results indicate that patients scoring higher on the action subscale as described by the TTM had a lower risk of drinking during treatment. With regard to sociodemographic variables, only employment status was related to abstinence during treatment.

Previous research has shown that social factors such as employment play a crucial role in therapy outcomes, whereas other sociodemographic variables (age, gender) are not consistently associated with the outcomes.^{5,6} In his review, Henkel²³ pointed out the strong relationship between unemployment and risk of relapse. His explanation of this result involves the negative psychosocial effects of unemployment, such as financial strain, anxiety about the future, and loss of social support. These factors may also have contributed to the results in this study. Henkel²³ emphasizes the importance of helping the unemployed patients to reintegrate into the professional world. Based on the results of this study, the Forel Clinic and other treatment programs should devote additional attention to the issue of unemployment.

Interestingly, in this study, substance-related variables did not contribute to the prediction of drinking during treatment, as has been described in other studies.^{5,6} This may have to do with the fact that patients entering relapse prevention treatment at the Forel Clinic have already undergone detoxification for at least ten days and the impact of the individual drinking pattern on the risk to relapse has thereby been diminished.

With regard to motivational factors, the motivational dimension action as defined by the TTM was an especially significant predictor of drinking during treatment, even when controlling for other variables. It seems logical in the current study that the action dimension had the greatest predictive value in relation to relapse during treatment. The action dimension could be particularly relevant in the first week of treatment, as it is an early stage in the process of achieving abstinence. Patients entering the Forel Clinic have only recently become abstinent and do not feel that they have already achieved anything that needs to be sustained (maintenance dimension); rather, they are learning to deal with problems and cravings without resorting to drinking. Moreover, patients that remain abstinent during their treatment in the Forel Clinic, may have already left behind the attitudes and behaviors of the

precontemplation and contemplation dimensions (e.g., being aware of the negative consequences of drinking and forming an intention to change the drinking behavior). These assumptions are supported by results by Zhang et al.¹⁶ who shows that scoring high on the action dimension is related to lower consumption of alcohol in the long term. Other researchers have demonstrated that drinking during therapy predicts drinking in the long run.^{3,4} This makes it even more important to strengthen therapy motivation during treatment in order to establish abstinence during as well as after treatment.

There was no significant association found between the type of drinking-related treatment goal and abstinence during treatment. This finding contrasted with the results from other studies, such as Berger et al.⁷ and Meyer et al.¹⁷ that have indicated a significant effect of the type of drinking-related treatment goal on therapy outcome. One explanation for our results could be the phenomenon that drinking-related treatment goals change during treatment, as other authors have shown.^{24,25} In this study, drinking-related treatment goals were only assessed at admission to treatment, so we cannot make a statement about the trajectory of patients' attitudes with respect to their drinking-related treatment goals. Furthermore, therapists assessed the drinking-related goal, addressing the following challenge: the therapeutic alliance should be stable enough for patients indicating their true goal.²⁶ Otherwise, the answer might be influenced by social desirability and thereby bias results (e.g. the goals stated do not reflect actual goals). Other researchers have suggested the construct of goal commitment as a measure of the strength of the intention to change one's behavior.²⁷ This construct should serve as a related, complementary motivational predictor in order to improve predictive validity of treatment motivation.

In general, it seems important to assess readiness for change, type of drinking-related treatment goal, and goal commitment over the course of treatment. These constructs may not only vary over the course of treatment, but also deviate from previous statements of commitment. A patient's agreement to the treatment goal of abstinence at the beginning of inpatient treatment does not guarantee the stability of commitment over the further course of treatment, nor does the stated commitment –here, a precondition for inpatient admission –necessarily reflect true commitment to continuous abstinence. Accordingly, assessing a patients' commitment to various drinking-related treatment goals and any change throughout treatment is likely to increase the predictive value of stage of change models.²⁷

In the field of addiction treatment, it must also be assumed that goals are not always compatible with each other.²⁸ For example, reaching an increased motivation to reduce drinking (e.g., “having only one drink per day”) might be associated with a reduced motivation to strive for continuous abstinence.

An application of the TTM to the field of addiction might further benefit from an extended elaboration of volitional and implicit processes. Intentional processes are responsible for the formation and the abandonment of intentions, whereas volitional processes are involved in the initiation and implementation of goals (e.g., delaying the short term benefit of substance use in favor of long term benefits^{29–31}). It would be interesting to investigate the interactions between intentional and volitional processes during relapse prevention treatment in order to obtain a more profound understanding of return to drinking and its therapeutic prevention.

Limitations

Overall, the study’s sample was relatively small ($N = 99$), limiting the model’s power to detect further effects. Although it was possible to explain additional variance in treatment outcome variables by assessing treatment motivation and drinking-related treatment goals, our model only explained about 31.9% of variance in the dependent variable. This is similar to the explanatory power of models from previous studies.^{13,15} In addition, the alpha levels of the internal consistencies of the subscales of the URICA were rather low. This may have led to slight biases in the results; nevertheless, the authors of the German short form of the URICA report good psychometric characteristics,⁹ which justifies the application of this questionnaire in this and future studies. Another limitation concerns the method of measurement for some variables. For example, drinking-related treatment goal and severity of alcohol use disorder were recorded by the therapist, using only one variable each. As a result, these variables may not have been captured comprehensively or objectively enough to identify an effect on the outcome variable. Finally, treatment motivation and drinking-related treatment goals were not continuously assessed; thus, nothing is known about how these constructs may have changed over the course of treatment. In future research, it would be desirable to continuously assess these attitudes in the form of a monitoring assessment. In this way, it may be possible to observe changes in patients at risk of terminating their treatment early and to respond to these changes.

Conclusion

Treatment motivation measured in accordance with the TTM predicts return to drinking during treatment beyond sociodemographic and substance-related variables. This verifies the importance of enhancing treatment motivation in order to prevent relapses during treatment and thus foster abstinence in the long term. This study confirms that the concepts of the TTM are relevant for addiction research.

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