Prediction of treatment outcome in a clinical sample of problem drinkers: self-efficacy, alcohol expectancies, and readiness to change

Motivation, Wirkungserwartungen und Abstinenzzuversicht: Lässt sich der Erfolg stationärer Behandlung alkoholabhängiger Patienten vorhersagen?

Abstract

Cognitive processes related to client motivation are important mediators of alcoholism treatment outcome. The present study aimed to expand previous research on client motivation and treatment outcome by establishing the predictive utility of self-efficacy, alcohol expectancies, and readiness to change in a sample of alcohol-dependent inpatients (N = 83). Treatment outcome was assessed three months following discharge. According to self-reported alcohol use, 22 clients were classified as abstainers and 41 clients as relapsers. Twenty participants were lost to follow-up. Readiness to change and anticipated reinforcement from alcohol predicted abstinence at follow-up. Client motivation was unrelated to both frequency and quantity of alcohol use. In accordance with social learning theory, self-efficacy was inversely correlated with alcohol expectancies. The results of the present study suggest that once abstinence has been violated factors other than pretreatment motivation determine drinking behavior.

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Zusammenfassung

Zuversicht ist eine wesentliche Voraussetzung der erfolgreichen Behandlung von Alkoholabhängigkeit und -missbrauch. Darüber hinaus lassen die Ergebnisse zahlreicher Untersuchungen einen Zusammenhang zwischen Alkoholwirkungserwartungen und Veränderungsbereitschaft einerseits und Abstinenz andererseits vermuten. Bislang wurde jedoch nicht untersucht, inwiefern zum Beispiel Alkoholwirkungserwartungen einen stärkeren Beitrag zur Vorhersage des Behandlungserfolgs leisten als Abstinenzzuversicht und Veränderungsbereitschaft. Daher wurde die relative prognostische Relevanz dieser Faktoren an einer Stichprobe von 83 alkoholabhängigen Patienten überprüft. Veränderungsbereitschaft und Alkoholwirkungserwartungen erlaubten eine Vorhersage der Abstinenz drei Monate nach Entlassung aus stationärer Behandlung. Häufigkeit und Ausmaß des Alkoholkonsums konnten jedoch nicht vorhergesagt werden. Positive Alkoholwirkungserwartungen gingen mit geringer Zuversicht einher.

Introduction

Cognitive processes related to client motivation are important mediators of alcoholism treatment outcome [1]. Both social learning theory [2] and the transtheoretical model of intentional behavior change [3] provide a general framework for research on client motivation. A number of studies established the relationship between treatment outcome on the one hand and self-efficacy [4], alcohol expectancies [5], and readiness to change [6] on

the other. However, virtually nothing is known about the relative utility of these variables in predicting treatment outcome.

Self-efficacy is a key concept in social learning theory. Bandura [7] defines self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). In the addiction field the term self-efficacy refers to the individual's expectancy to resist the urge to use drugs in a stressful or "high-risk" situation [8].

According to Marlatt and Gordon [9], high self-efficacy is closely related to successful coping behavior. Cognitive-behavioral treatment programs including some form of coping skills training appear to enhance the client's self-efficacy [10]. Likewise, interventions adapted from motivational interviewing [11] seek to strengthen "the client's confidence in his or her capability to cope with obstacles" (p. 41). In line with social learning theory, drinking refusal self-efficacy has been shown to increase during the course of treatment [12] and to predict treatment outcome [4].

Outcome expectancy has been proposed as another important determinant of behavior change by social learning theory [13]. Alcohol outcome expectancies, i.e. the short-term effects of alcohol consumption anticipated by an individual, have been shown to predict initiation of drinking during adolescence [14], transition from non-problem to problem drinking [15], and relapse following treatment for alcohol dependence [5]. The relationship between outcome expectancies and self-efficacy has been a source of confusion and controversy [16]. Bandura [7] emphasizes that outcome expectancies are determined primarily by self-efficacy expectancies. Consequently, alcohol expectancies should be less powerful in predicting treatment outcome than self-efficacy. However, alcohol expectancies are related to a variety of factors including personality [17], setting [18], and the anticipated blood alcohol concentration [19]. Therefore, outcome expectancies may be important independent predictors of drinking behavior.

The transtheoretical model of intentional behavior change assumes that intentional behavior change involves passing through a sequence of discrete stages. Based on the results of numerous studies and previous versions of the model, Prochaska et al. [3] described five stages of change: (1) precontemplation, (2) contemplation, (3) preparation, (4) action, and (5) maintenance. According to Prochaska et al. [3], individuals addicted to psychotropic drugs typically recycle through these stages several times before achieving sustained long-term behavior change. A number of self-administered questionnaires have been developed to assess an individual's "readiness to change" and to assign clients to particular stages of change [8].

The stages of change approach has been criticized for a variety of reasons. For example, it has been stated that the transtheoretical model describes arbitrary pseudo-stages [20], [21], [22]. However, in a previous study based on the self-reports of 125 alcoholism treatment clients, readiness to change predicted abstinence at 12-month follow-up [6]. In another study using the Readiness to Change Questionnaire (RCQ [23]) and the Negative Alcohol Expectancy Questionnaire (NAEQ [24]) to assess client motivation, both readiness to change and alcohol expectancies were related to treatment outcome [25]. However, the results of this study should be interpreted with caution for two reasons. First, the RCQ was designed to measure client motivation in primary health care settings [23]. Second, the NAEQ items describe not only

negative alcohol expectancies, but also consequences of long-term alcohol abuse and symptoms of problem drinking (e.g., "If I continued to drink at my present level, then I would end up in hospital."). Including such items is very likely to increase variance explained [26].

The present study aims to expand the research on client motivation and treatment outcome by establishing the relative utility of self-efficacy, alcohol expectancies, and readiness to change in predicting drinking behavior following inpatient treatment for alcohol dependence. Furthermore, the relationship between expectancies and readiness to change is examined.

Methods

Participants

Ninety-three volunteers from an inpatient treatment unit of a psychiatric hospital (Westfälische Klinik für Psychiatrie und Psychotherapie Münster) participated in this study. Over a period of three months (mid-January to mid-April 2001) subjects were selected from successive admissions for participation in the study if they met the following criteria: (1) alcohol dependence according to ICD-10 [27]; (2) maximum age of 60 years; (3) no cognitive or verbal impairment; (4) no primary diagnosis of drug dependence (including dependence on illicit drugs, sedatives, hypnotics or anxiolytics); (5) resident of the local community. Ninety-three individuals admitted to the hospital did not meet these criteria. In addition, 20 patients declined to participate in the study. Ten subjects were excluded from the study due to incomplete data. The final sample consisted of 83 inpatients (mean age of 43.67 years, $SD = 8.41$). Of the sample, 81% were male, 23% were married, and 53% were currently unemployed. The majority of the entire sample (90%) reported at least one previous detoxification (mean number of previous detoxifications = 9.95, $Mdn = 4.5$, $SD = 14.57$, $Max = 80$, information was not provided by one subject). Sixty-nine subjects (83%) were self-described smokers.

Procedures

Subjects participated in a multi-site study on the outcome of short-term inpatient treatment [28]. The mean length of inpatient stay was 11.94 days ($Mdn = 10$, $Min = 2$, $Max = 41$, $SD = 6.78$). Within five days following admission, patients were invited to participate in the study. Written informed consent was obtained and subjects completed a number of questionnaires including the Alcohol Expectancy Questionnaire (AEQ [29]), the Drug Taking Confidence Questionnaire (DTCQ [8]), and the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES [30]). The AEQ and the DTCQ were administered at the Münster site only. A standardized clinical interview was administered by advanced undergraduate students or staff members to all participants to assess sociodemographic background, alcohol consumption,

and the number of previous detoxifications. By the time of baseline assessment all subjects were completely detoxified (blood alcohol concentration was zero) and free from clinically significant symptoms of acute alcohol withdrawal. Treatment outcome was assessed approximately 90 days following discharge ($M = 91.1$, $Mdn = 90$, $Min = 76$, $Max = 117$, $SD = 7.58$). Again, a standardized clinical interview was administered by advanced undergraduate students or staff members via telephone or in person.

At both baseline and follow-up alcohol use was assessed using the following measures: (1) the number of drinking days during the month preceding the interview (frequency), (2) the average number of drinks (beer, wine or liquor) per day in the week preceding admission/follow-up (quantity). Responses to the quantity item were transformed into grams of pure alcohol. At follow-up two groups of subjects were defined according to their reports of alcohol use during the 3-month follow-up period. Subjects were classified either as abstainers (reporting no alcohol use at all during the follow-up period) or relapsers (having had at least one drink of alcohol during the follow-up period). All statistical analyses were performed with the SPSS software package (Version 11.0). Only complete questionnaires (no missing data) were entered into analysis.

Measures

Alcohol Expectancy Questionnaire. A German-language version of the AEQ (AEQ-G [31]) was used to assess alcohol outcome expectancies. The AEQ-G comprises 19 items describing anticipated reinforcement from alcohol (the AEQ-G is available online at <http://wwwpsy.uni-muenster.de/institut1/ehes/startseite.htm>). Participants are asked to agree or disagree with each statement (dichotomous response format). Factor analysis established two AEQ-G subscales. The first factor (nine items) represents the anticipation of increased social assertiveness (Cronbach's $\alpha = 0.90$). Factor two (ten items) describes alcohol-induced tension reduction and mood management (Cronbach's $\alpha = 0.70$).

Drug Taking Confidence Questionnaire. A German-language version of the DTCQ (DTCQ-G [32]) was used to assess drinking refusal self-efficacy. The DTCQ-G comprises 32 items representing a variety of high-risk situations. Participants rate their confidence in their ability to resist the urge to drink on a 6-point scale ranging from "0" (not at all confident) to "100" (very confident). Factor analysis suggested a single factor solution (Cronbach's $\alpha = 0.97$).

Stages of Change Readiness and Treatment Eagerness Scale. A German-language version of the SOCRATES (SOCRATES-G [33], [34]) was used to assess client motivation in accordance with the transtheoretical model. The SOCRATES-G comprises 19 items reflecting readiness to change drinking behavior. Clients are asked to indicate the extent of their agreement with each statement on a 5-point Likert-type scale. The factor structure of the SO-

CRATES-G corresponds almost completely to that of the original version. Factor analysis established three subscales: (1) Taking Steps (Cronbach's $\alpha = 0.84$), (2) Recognition (Cronbach's $\alpha = 0.78$), and (3) Ambivalence (Cronbach's $\alpha = 0.68$). According to Miller and Tonigan [38], these factors reflect "continuously distributed motivational processes that may underlie stages of change" (p. 84).

Intake and follow-up interview. A standardized clinical interview was administered at baseline and follow-up to assess sociodemographic background, alcohol consumption, and the number of previous detoxifications. This interview included items adapted from a German-language version of the Addiction Severity Index [35], [36].

Results

Correlations (Pearson correlation coefficient) among baseline measures ranged from $r = -0.51$ to $r = 0.50$ (Table 1). Sixty-three participants completed follow-up interviews. More than half of the follow-up interviews (56%) were administered via telephone. According to self-reported alcohol use, 22 clients were classified as abstainers and 41 clients as relapsers. Twenty participants were lost to follow-up. These clients did not differ on any baseline measure from those located for follow-up. Three separate stepwise multiple regression analyses (forward inclusion) were conducted to examine the relationship between measures of client motivation (DTCQ-G total score; AEQ-G total score, SOCRATES-G subscores) and treatment outcome (abstinence, frequency of alcohol use, quantity of alcohol use). Stepwise regression was chosen in order to select significant predictors of treatment outcome empirically without favouring one theoretical model over the other. Readiness to change (Taking Steps) and anticipated reinforcement from alcohol (AEQ-G total score) predicted abstinence at follow-up (Table 2). The overall model accounted for 18.6% of the variance in treatment outcome (relapse vs. no relapse). Client motivation was unrelated to both frequency and quantity of alcohol use.

Discussion

The primary purpose of the present study was to examine the relationship between client motivation and treatment outcome. For the first time, the relative predictive utility of self-efficacy, alcohol expectancies, and readiness to change was studied in a sample of alcohol-dependent inpatients. Both alcohol expectancies and readiness to change were related to abstinence following inpatient treatment for alcohol dependence. These findings are in accordance with the results of previous research [5], [6]. Neither outcome expectancies nor readiness to change predicted treatment outcome in terms of frequency and quantity of alcohol use. Once abstinence has been violated factors other than pretreatment motivation appear

Table 1: Correlations Among Baseline Measures (Pearson correlation coefficient r)

	1	2	3	4	5	6	7	8	9
1. Age	--								
2. Number of Detoxifications	.14	--							
3. Frequency of Alcohol Use	-.26*	-.19	--						
4. Quantity of Alcohol Use	-.11	.13	.50***	--					
5. Self-Efficacy	.04	-.18	-.18	-.20	--				
6. Alcohol Expectancies	-.10	.02	.32**	.05	-.47***	--			
7. Taking Steps	.01	-.51***	-.03	-.28*	.39***	-.01	--		
8. Recognition	-.03	.11	.12	.16	-.07	.21	.02	--	
9. Ambivalence	-.05	.02	.09	.10	-.04	.11	.30**	.19	--

Note.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2: Summary of Logistic Regression Analysis Predicting Abstinence

Variable	<u>B</u>	<u>SE</u>	Odds ratio	Wald statistic
Taking Steps	-.10	.05	.90	4.63*
AEQ Total Score	.14	.07	1.14	3.90*

Note.

* $p < .05$.

to determine both frequency and quantity of alcohol use [6]. Contrary to past research, self-efficacy was not related to treatment outcome. Given the relatively consistent findings of previous studies [37], this result should be viewed as tentative. End-of-treatment self-efficacy [4] or changes of self-efficacy over the course of treatment [38] might be more powerful predictors of recovery from alcohol problems.

Correlations between expectancies and readiness to change were low to modest. However, self-efficacy was substantially correlated with positive alcohol expectancies. In line with social learning theory and previous expectancy research based on the self-reports of college students [6], low confidence was associated with the anticipation of reinforcement from alcohol. The relationship of alcohol expectancies to both treatment outcome and self-efficacy highlights the potential clinical utility of assessing outcome expectancies. Interventions designed to alter the expectancies of alcohol-dependent individuals may be a useful extension of substance abuse treatment. Past efforts to change alcohol expectancies in non-clinical

samples produced mixed results [39], [40]. Certainly, simply providing straight-forward information about the short-term effects of alcohol is unlikely to change the highly persistent expectancies of alcohol-dependent individuals [41].

Taking Steps was the only SOCRATES subscale related to treatment outcome. Those clients scoring high on Taking Steps - and presumably ready to change - were more likely to be abstinent three months following discharge. It appears to be counter-intuitive that readiness to change predicted success in a sample of alcohol-dependent inpatients since all participants had entered treatment and had thus already initiated behavior change. However, alcoholism treatment clients differ considerably with respect to their readiness to change [42]. Despite a long-term history of alcoholism as indicated by a great number of previous detoxifications, inpatient treatment might have been inappropriate for many clients since it did not correspond to their stage of change. The negative correlation between readiness to change and the number

of previous detoxifications clearly contradicts a "bottoming out" approach [43].

Some limitations should be considered when interpreting the results of the present study. First, the small sample size and the relatively high number of subjects lost to follow-up may have limited the ability to detect relationships between measures of client motivation and treatment outcome. Second, approximately half of the follow-up interviews were administered via telephone. Third, evaluation of treatment outcome was based exclusively on self-reported alcohol use. However, past research supports the validity of telephone interviews and information provided by alcohol-dependent inpatients [44], [45]. Future research may address a number of issues related to client motivation and treatment outcome. First, further studies are needed to determine the relationship between negative alcohol expectancies, e.g. anticipated motor and cognitive impairment, and treatment outcome. In previous studies negative alcohol expectancies have been either ignored [5] or confounded with long-term consequences of problem drinking [25]. Second, more frequent and real time assessment of client motivation over the course of treatment and following discharge will increase the ability to predict relapse [46]. However, resources may limit the number of assessments and the use of advanced technologies such as palm-top computers. Finally, virtually nothing is known about the concurrent validity of multi-dimensional assessment instruments such as the SOCRATES on the one hand and single item algorithms or visual analogue scales on the other [47]. The development and validation of simple measures may encourage the assessment of client motivation in substance abuse treatment.

Acknowledgements

This research was supported by the Landschaftsverband Westfalen-Lippe. The authors wish to thank Jutta Hagen, Kelley Kucaba, Jennifer Nicolai, and Alexander L. Gerlach for their helpful comments on drafts of this article.

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Please cite as

Demmel R, Beck B, Lammers A. Prediction of treatment outcome in a clinical sample of problem drinkers: self-efficacy, alcohol expectancies, and readiness to change. *Ger Med Sci*. 2003;1:Doc06.

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<http://www.ejms.de/en/gms/2003-1/000006.shtml>

Received: 2003-08-13

Published: 2003-10-15

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