Gender- and age-related predictors of relapse after inpatient treatment. A replication and pilot study.

Heinz C. Vollmer

This manuscript has not undergone external peer review and will not be submitted to a publisher due to the high costs. The evaluation was carried out by me with great care, including a double review of the results. The text was translated into English with the assistance of Google Translate.

I thank all the patients and colleagues who made this work possible, and I thank Dr. Julia Domma, Managing Director of the salus Clinics (Hürth), for her support.
Furthermore, I would like to thank the IFT, Centre for Mental Health and Addiction Research (Munich) for its organizational support regarding all my publications.
I have been providing therapeutic care to addicted people for more than 40 years, following the scientist-practitioner model.
I am completely independent of the salus Clinics (Hürth) and the IFT Institut für Therapieforschung, Centre for Mental Health and Addiction Research (Munich). With this manuscript, as with my website, I wish to make my professional experience available.

I posted this manuscript on my website (www.vollmer.site) in Mai 2026.

Abstract

Background

The assumption is that the contradictory prognostic criteria in the empirical literature are due to differences in the samples and in the therapies.

Question

To what extent can gender- and age-specific prognostic criteria for relapse be replicated in another very similar therapy facility?

Methods

Two studies (replication and pilot) in one, as the analysis methods of the two retrospective studies overlap. Separately for female and male age groups (<43, 43-51, >51 years), differences between alcohol-dependent persons who were consistently abstinent versus those who had relapsed at the one-year follow-up were analyzed using binary logistic regressions, stratified chi square tests and the two calculation methods QACC (follow-up known, female: n=269, male: n= 433) and QATC (plus follow-up unknown = relapsed, female: n=480, male: n=833, nonbinary: n=0).

The **results** support the following hypotheses:

1. Prognostic criteria are almost identical between very similar therapy programs (e.g. in no comparison of the predictors was there an opposite result between the two clinics (A, B), even at a 10 % significance level).

2. Age- and gender-specific subgroups differ in abstinence rates and prognostic criteria (e.g. among middle-aged workers with fewer than three previous detoxifications, a lack of partnership correlated in both clinics (A, B) more with abstinence for women (A: OR: 2.9, p=.105; B: OR: 2.0 p=.079) and more with relapse for men (A: OR: 2.4, p=.063; B: OR: 2.0, p=.037)).

3. The group with the highest risk of relapse are unemployed younger men (A: 85,9 %, B: 81,3 %), especially those with more than two previous detoxes (A: 92,1 %, B: 92,3 %).

4. The two calculation methods for relapse rates lead to similar prognostic criteria (e.g. not gainfully employed were equally correlated with relapse rates in middle-aged men, according to QACC: OR: 3.30, p<.001; according to QATP: OR: 2.59, p<.001).

5. Prognostic criteria depend on the distribution of characteristics within the samples (e.g. Criterion no partner: for unemployed, older men, OR: 6.7, p=.004, for working older men: OR: 1.2, p=.689).

6. Prognostic criteria depend on the evaluation methods (e.g. unemployed younger men: bin. log. regression: OR: 1.2, p=.649; cross tab: OR: 2.6, p=.004)

7. Younger women and men in particular differ in the frequency of potential prognostic features (e.g. work, comorbidity, partner) and have a 15 - 20% lower abstinence rate than older people.

Conclusions

Research and therapies should not be limited to a gender differentiation, but should also take into account the life situation, which may have a stronger influence on the results than gender. In particular, there is an increased need for research into the situation of younger women and men, a group that has been neglected to date. The combination of several evaluation methods can be helpful in identifying prognostic criteria relevant to therapy.

keywords: Alcohol dependence, gender, therapy, predictors, relapse

1. Introduction

Although there are numerous studies to predict abstinence or relapse after treatment in alcohol dependent individuals, we are not aware of any generally accepted sociodemographic or diagnostic prognostic criteria. In some studies men tend to be more abstinent after therapy, in others women. Again in other studies, there are no differences in abstinence or relapse between men and women. The results on partner and work situation, personality disorders, depression and other potential prognostic features are similarly contradictory (1-3). Depending on the type of treatment, sample and evaluation method, different prognosis criteria for abstinence after treatment of alcohol-dependent persons seem to result. The lack of generally applicable prognosis criteria becomes particularly clear when comparing outpatient and inpatient therapies or American and German studies, which often differ greatly in terms of therapy programs (e.g. duration of therapy) and methods (e.g. success criteria). Despite the then groundbreaking therapeutic approaches of Marlatt & George (4) or Prochaska & DiClemente (5) and now other interesting interventions such as CBM (6), mindfulness (7), exposure (8, 9), etc., the abstinence rates after inpatient drug rehabilitation of alcohol dependent people have been below 40% for more than 20 years (e.g. 10-13).

For the situation in Germany, and possibly also elsewhere, it must be taken into account that today's therapies for alcohol-dependent persons (e.g. 14-16) and the training courses for addiction therapists (e.g. 17, 18) were developed very successfully around 40 years ago on the basis of empirical research and therapeutic experience, including the above-mentioned approaches, at a time when the vast majority of alcohol dependent individuals entering inpatient treatment were males in their 40s to 50s (e.g. 10, 19) and the central goals of treatment were abstinence and reintegration into employment (20). Therapy programs for younger patients were the exception in Germany (e.g. 21) and were not further funded at the time unless the treatment was adapted to the level of knowledge based on the successful experience with older, predominantly male patients. For example, the treatment of young alcohol dependents with the goal of controlled drinking was discontinued and

the group subsequently had to be redefined as “juveniles and young adults with alcohol problems” (22). In practice, there is now greater consideration for minorities, but research into the treatment of persons dependent on alcohol remains focused on middle-aged men, the most prevalent group receiving inpatient treatment (23). It is therefore not surprising that older, non-unemployed patients without therapy experience were almost four times as likely to be abstinent after therapy as the group without these characteristics (50,1 % vs. 12,0 %) (24). If one assumes that there is a causal relationship between therapy and outcome, then the search for universal prognostic criteria is very stimulating but not helpful in the long term unless one takes into account the social models on which the research is based and accepts the diversity of social groups and therapy approaches. These considerations and the inconsistent results prompted us to conduct replication studies with very similar samples, treatment settings, and evaluation methods to identify subgroup-specific determinants of abstinence or relapse. For example, parallel comparison with the characteristics of age, gender, work and partner situation, and school education led to equally high success rates in alcohol and drug dependent patients (25, p. 7), although the latter group is generally assessed in the specialist literature as prognostically unfavorable (e.g. 26, p. 64 vs. 13, p.73). This unexpected result was replicated in a second study using data from another clinic by parallelizing the first three characteristics mentioned above. Again, alcohol and drug dependent patients did not differ in the abstinence rate (OR: 1.02; p=.921; N=640), (see 27, p. 107).

Therefore, we continued the search for predictors in another sample of alcohol-dependent individuals, with the result that the patients differed in their prognostic characteristics depending on age and gender (28). The strongest predictors of relapse in men were: in the 19-41 and 49-54 year olds: “not gainfully employed” (OR: 1.9; p=.020; OR: 2.3; p=.006), in the 42-48 year olds: addiction-related comorbidity without tobacco (OR: 2.9; p=.008), and in the >54 year olds: previous inpatient drug rehab (OR: 4.5; p<.001). For women, the predictors with the highest effect sizes were

prior previous inpatient drug rehab, but only in 19-41 year olds (OR: 2.7; p=.036) and 42-48 year olds (OR: 3.6; p<.001). In the 49-54 year old women, schooling above secondary level was the strongest predictor (OR: 2.9; p=.015) and in the over 54 year old depression (OR: 1.9; p=.058), (see 28, p.136). The abstinence rate of the patients increased with increasing age, in men from 26.1% to 50.8%, in women from 25.2% to 40.4%. In a comparison of men and women, only women over the age of 54 relapsed more frequently than men of the same age (d=0.31; p<.01), (see 28, p. 135). The characteristics previous inpatient detoxification, depression or personality disorder were not a significant predictor (p<.01) in any of the eight age- and gender-specific groups. In the following study, we examined the extent to which these results can be replicated.

2. Method

2.1 Questions and Hypotheses

Our hypotheses are that the age-sex separated groups a) differ in prognostic characteristics and b) agree with those of our previous study, which was limited to the follow-up patients. In the course of the evaluations, the following questions arose: Does the inclusion of patients who were unknown by follow-up lead to similar results when these patients are assigned to the group of relapsers? To what extent do the two clinics differ in relapse rates when the characteristic with the highest prognostic valence is combined with other characteristics? This last question was intended to descriptively determine which combinations of characteristics are particularly critical for relapse, and whether the two clinics differ in this regard.

2.2 Recruitment

Alcohol-dependent people are informed about therapy offers in Germany (e.g. outpatient or inpatient, behavioral therapy or depth psychology) by independent addiction counselors, whether in counseling centers, corporate social services, psychiatric or general clinics. Together with an

addiction counselor, the patients decide on an outpatient or inpatient treatment facility and submit an application for coverage of the treatment costs, usually by the German Pension Fund (e.g. 29). After completing a detox, patients can begin the weaning off treatment in an outpatient or inpatient facility.

2.3 Sample

All consecutively admitted patients with an ICD-10 initial diagnosis F10.2 (alcohol dependence) and a length of stay > 14 days were included in this retrospective field study as part of the quality management of a specialist clinic for the treatment of dependent people. A one-year follow-up was available for 54% of the 1313 patients (Table 1). The mean age of these 702 patients was 48 years (SD: 9.7). 61.7% of the patients were male, 38,3% female, 44.9% without a partner, 33.2% married, 43.7% were unemployed. In terms of age, work and partner situation, marital status, number of previous detoxifications or weaning off treatments, and mental comorbidity, these patients differed significantly from the patients whose catamnestic history is unknown.

- Table 1 about here -

2.4 Treatment

The clinic's therapy program was based on the guidelines of the German Pension Fund (20). In addition to the focus on psychotherapy, the patients were offered work, sports and art therapy and somatic care, depending on the indication. The social service helped the patients to cope with professional and administrative problems. According to the AWMF guidelines (30), pharmacological treatment was only used in very few patients with a diagnosis of depression (approx. 4%). The two main goals of treatment were abstinence from all psychotropic substances (except tobacco and caffeine) and reintegration into work and social life. The psychotherapeutic treatment was based on the models of Beck et al. (31, 32), Kanfer & Schefft (33), Lindenmeyer (34), Marlatt & Gordon (35), Miller & Rollnick (36), Schneider (37) and Witkiewitz & Marlatt (38).

The patients participated in one psychotherapeutic individual therapy and in 3-5 group therapy sessions per week. The individual treatment plans were drawn up together with the patient and the treating psychotherapist or addiction therapist and discussed in the interdisciplinary team. The average duration of therapy was 87 days (SD: 26.9).

2.5 Survey instruments

Sociodemographic characteristics were collected by the treating therapists in the first two days of treatment using an electronic questionnaire. The ICD-10 diagnoses (39) were established based on a semi-standardized interview in the first week of treatment by a psychotherapist responsible for treatment and the treating psychiatrist. One year after the end of treatment, the patients received a catamnesis sheet from the clinic with questions about the use of all psychotropic substance classes (e.g. alcohol, cannabis, barbiturates, stimulants, medication with the potential for dependence) over the entire one-year period.

2.6 Evaluation

With the age of the female patients known from the catamnestic, three groups were formed using terciles, which were also used for the grouping of the male patients. The following age groups resulted: 19-42, 43-51, 52-76. The formation of quartiles, as in Study B, was not possible due to the smaller sample of this study. In the pseudonymised analysis, patients who stated that they had consumed psychotropic substances in the period after treatment, even if it was only for a few days or if they had been abstinent for several weeks, were classified as having relapsed.

The following characteristics were included in the binary logistic regression calculation for all six groups: school education, employment, partner situation, previous inpatient detoxification, previous inpatient drug rehab and the diagnoses of depression, personality disorder and comorbid dependence on psychotropic substances (except tobacco, caffeine). After an initial review of

potential predictors, a reduction to four characteristics (partner and work situation, previous inpatient detoxification, mental comorbidity without addiction) was made to achieve sufficient sample sizes in all cells. The correlation between these variables in all cases was: $r < 0.17$.

Frequency distributions were tested using the Chi square, with sample sizes <26 using the Fisher-Yates test. If a cell was occupied by zero, all four cells were corrected by +0.5 (40) and the significance values were taken from the Hald & Sinkbaek tapestry (41, 42). Central tendencies were calculated using the Kruskal-Wallis H test. Effect sizes for the cross-tabs were calculated according to Cohen's d using the formula $d = \ln OR * ((\sqrt{3})/\pi)$, see (43). With the exception of the chi-square tests with zero occupancy of cells, all calculations were performed using SPSS 17 (44).

As in our previous study, the calculation of the abstinence or relapse rate was based on the QACC12m method (**Q**uota **A**bstinence **C**atamneses **C**onsented): abstinence rate of the patients known from the follow-up, without taking into account the unknown. With the QATP12m calculation method (**Q**uota **A**bstinence **T**otal **P**atients), on the other hand, all patients whose history is unknown are classified as relapsed (45). "12m" stands for 12 months of continuous abstinence. The great agreement between the results of the two calculation methods prompted us to switch to the QATP calculation method in the course of the study and to carry out some new evaluations of the old data from clinic B using calculation method QATP, while maintaining the age and sex-specific grouping of this clinic, and without taking into account the 49-54 year olds. The originally planned replication study thus became an additional pilot study to generate new hypotheses and to reflect on the methodological approach.

For identifying prognosis criteria using binary logistical regression or cross-tabulation, a significance level of 1% was set without a significance correction. The comparison of the two

clinics is partly purely descriptive, taking into account the relapse rates, the significance values and the effect sizes, in order to avoid incorrect interpretations by neglecting a beta error. Because of the small samples, we consider effect sizes above a medium value (OR > 2.2 or d > 0.45) to be an indication of a valid predictor if the probability of error is ≤1% or as a possible predictor if the probability of error is ≤ 10 %. The detailed tables with the effect sizes and significance values are intended as a suggestion for further replication studies.

3. Results

3.1 Rehab clinic A

3.1.1 Differences between groups at baseline

The six groups of patients, separated according to age and sex, differed significantly in the characteristics of work situation, marital status, personality disorders and addiction-related comorbidity. Regardless of age group, men were more likely to be unemployed and women were more likely to work in the household (Table 2). The men more often had a diagnosis of comorbid dependence (except for those over 51 years old) and the women more often had a diagnosis of mental comorbidity, especially depression and personality disorder (Table 3). In the frequency of previous “detoxification >2” or “inpatient drug-rehab >0” the women and men and the age groups did not differ from each other. The median for number of previous detoxification treatments was Md=2, for number of previous inpatient drug-rehab Md=0. The age distribution tended towards the older patients (M=35) in the 19 to 43 year olds and towards the younger patients in the over 51 year olds (M=57). Inclusion of the patients whose catamnestic history was unknown led to very similar results.

- Table 2, 3 about here -

3.1.2 12-month follow-up

With increasing age, the number of catamnestically achieved and the number of abstinent patients increased. Men and women did not differ significantly in follow-up responses and abstinence rates. For both sexes, abstinence rates increased with age. (Table 4). Compared to older people, younger men and women had a 15-20% lower abstinence rate.

- Table 4, 5 about here -

3.1.3 Predictors of relapse, calculation method QACC and QATP

According to calculation method QACC previous “detoxification >2” was the strongest predictor for younger and older men (OR: 3.8, p=.003; OR: 4.0, p<.001), while “not gainfully employed” was the strongest predictor for middle-aged men (OR: 3.15, p=.001) (Table 5). These two characteristics were of minor importance for the majority of the other groups, since the effect sizes were small or beta errors (because of p>.180) were rather unlikely, with the exception of a result that tended (p=.131) to be the opposite for the older not gainfully employed men (OR: 0.54). In older men, the characteristic “no partner” tended to be more conducive to recidivism (OR: 2.28, p=.029), while in older women it was more conducive to abstinence (OR: 0.44, p=.071). In all three groups of men, the explained variance was low between 12.7% and 17.2%. The explanation of the variance was even lower for the three groups of women (7.9 - 11.9 %). An evaluation according to QATP12m (all unknown patients = relapsed) came to a similar result (Table 5, penultimate line). Potential prognostic characteristics became more visible in the women after stepwise backward selection of the characteristics and after inclusion of the patients who had not been reached at the follow-up. Irrespective of age, there was a tendency among women that mental comorbidity could have predictive value (OR: > 2.0, p<.10).

3.1.4 Previous detoxification combined with other characteristics, QACC

When evaluating the results regarding the comparison of the number of previous detoxification >2 vs. <3, separately for the subgroups comorbidity, work and partner situation, it should be noted that

these groups overlap. Among the younger men (<43 years), relapses associated with more than two detoxifications were increased many-fold, particularly among the employed (OR: 6.0, p=.028), those without a mental comorbidity (OR: 7.3, p=.011), and those without an addiction-related comorbidity (OR: 14.0, p=.003) (Table. 6). Younger male patients with more than two detoxifications and no F1 comorbidity or no mental comorbidity had the highest relapse rates (93.3 %, N=15; 85.7 %, N=14). Also in the older men (>51 years), the relapse rates in most subgroups were significantly increased by the number of previous detoxifications. In middle-aged men (43-51 years), there was no connection between the number of detoxifications and relapse in any subgroup, despite sufficient sample sizes. The sample sizes for women in some subgroups are so small that it was not possible to calculate cross product quotients. There were no significant differences in the comparison of the number of detoxifications in the remaining subgroups of women. In purely descriptive terms, the recidivism rates of women with detoxification >2 were above the average for the respective age group in most subgroups; for example, highest at 77.8% in women >51 years, with F1 comorbidity (without F17), but N=9.

- Table 6 about here -

3.1.5 Comparison of the calculation methods QACC and QATP

The results on the connection between previous detoxifications and relapse rates according to QACC12m (Table 6) agree with an identical evaluation according to QATP12m (Table 7). The relapse rates and the cross product quotients and significance values in the comparison of detoxification >2 vs. <3 are shown in Table 7, for clinic A the first value in each cell. A few examples for better understanding: According to the QATP calculation, the younger male patients of clinic A with more than two detoxifications had a relapse rate of 97.5% (N=40) if no F1 comorbidity, and 94.4% (N=36) if no mental comorbidity was present (Table 7, column 2, row 9, 7), according to QACC: 93.3% and 85.7% (Table 6, column 2, row 9, 7). Likewise, the effect sizes for this characteristic were also very similar when comparing the two calculation methods QATP and

QACC: OR: 15.8 or 14.0; OR: 7.6 or 7.3 (Table. 6 and 7, each column 2, row 9, 7). There were no contradictory results between the two calculation methods, but especially in the case of women, the larger samples led to higher p-values in some comparisons, such as in the case of the older women (Table. 6 and 7, each last column, row 8-12).

- Table 7 about here -

3.2 Comparison of the two rehab clinics A and B

The following comparisons of the results of the binary logistic regressions refer to the QACC calculation method, the original calculation method of Clinic B. All other analyzes were carried out according to QATP.

3.2.1 Previous addiction treatments

According to the results of the binary logistic regressions, previous drug rehabilitation in clinic A was not a significant predictor in any group, but was in clinic B (older men, middle-aged women). Previous detoxification was not a significant predictor in any of the eight groups in Clinic B (28, p. 136), but was a significant predictor in two male groups in Clinic A (Table 5).

The number of previous detoxifications in both clinics was: median: 2, upper quartile: 5. From a value > 20 detoxifications, there were isolated extreme values (maximum 300) in both clinics, the validity of which cannot be verified. Therefore, the analysis was limited to a comparison of patients with previous detoxifications: 0-1 vs. 2-4 vs. >4. For these three groups, the recidivism rates were: Clinic A: 65.0 %, 72.2 %, 84.3 %; Chi Quadrat: 38.106, df: 2, $p<.001$, N=1284; Clinic B: 54.4 %, 66.6 %, 80.3 %; Chi Quadrat: 118.310, df: 2, $p<.001$, N=2610. With the exception of the middle-aged women (43-51 years) of clinic A, the relapse rates in both clinics in all gender-specific age groups were significantly ($p<.01$) or as trend ($p<.08$) similarly increased with the number of previous detoxifications (0-1, 2-4, >4).

3.2.2 Previous detoxification combined with other characteristics

Table 7 shows the relapse rates and effect sizes for both clinics in a comparison of detoxification >2 vs. <3. With the exception of all employed persons in Clinic B and three exceptions in Clinic A, all relapse rates for patients with more than two detoxifications are purely descriptively above the average for the respective gender-specific age group. Examples: While the relapse rate for the younger male patients in Clinic B was on average 73.9%, it was 50% for the employed persons with more than 2 detoxifications and is 1.5 times more likely than the relapse rate for the employed with fewer than 3 detoxifications, but only with a significance value p=.259 (Table 7, column 2, row 5). Among the younger patients in Clinic A, the average relapse rate was 82.5%. The relapse rate of employed persons with more than 2 detoxifications, however, was 89.5% and the probability was 5.3 times higher than the relapse rate of those with fewer than 3 detoxifications, with a significance value of p=.026. Especially among younger men in both clinics, regardless of the subgroup, with the exception of those who were employed at clinic B, the relapse rate was increased in people with previous detoxification >2, and in each case significantly or in trend with a medium or high effect size. In the remaining gender-specific age groups, the effect of previous detoxifications was not as clear depending on the subgroup. But, with one exception (unemployed younger women), the comparison of patients with detoxification >2 vs. <3 in both clinics always pointed in the same direction, as OR >1.0. In some subgroups, the difference in relapse rates between people with detoxification >2 vs. <3 was significant in both clinics, such as younger male patients with no F2-F6 or no F1 comorbidity or no partner. In other subgroups, the difference is significant in one clinic and only trending in the other clinic (e.g., older women with F1 comorbidity) or not significant in both clinics (e.g., middle-aged men with F2-F6 comorbidity). Because the subgroups overlap, the number of matches should not be interpreted as the degree of confirmation of the results.

3.2.3 Mental comorbidity and partner situation

In order to analyze the influence of the partner situation and the mental comorbidity, we created layered cross tables separately for the subgroups work situation and previous detoxification (Table 8). Compared to Table 7, this reduces the number of overlaps between the subgroups.

- Table 8 about here -

3.2.3.1 Mental comorbidity,

According to the results of the binary logistic regressions, there was no significant association (p>.01) between mental comorbidity (without F1) and relapse in both clinics. In the cross-tabulations, there was only agreement between the two clinics for unemployed middle-aged men, detox<3 (Table 8): A: OR=4.4, p=.014; B: OR=2.8, p=.078). Only in one group (Clinic A, older unemployed women, detox<3) was there a significant correlation between mental comorbidity and relapse (OR: 28.0, p=.001). There were no contradictory results between the two clinics with regard to mental comorbidity, ignoring the opposite trend with p-values >.200 in the younger women of Clinic B. Due to insufficient cell occupancy, comparisons between the two clinics were not possible in some female samples.

3.2.3.2 Partner situation

According to the binary logistic regressions, there were also only isolated trend results for the partner situation in both clinics. In contrast to the men, the OR values of the women in both clinics pointed towards an increased probability of relapse in the presence of an existing relationship rather than in the absence of a relationship, as in the case of the men (exceptions: A: young men, B: young women) (A: Table 5, B: Table 4 (28, p. 136)). According to the evaluations using stratified cross tables, this trend in both clinics only applied to employed middle-aged men and women with detoxification <3. While among middle-aged workers with detox< 3 in both clinics, men were more likely to relapse if they did not have a partner, women were more likely to relapse if they had a

partner (see table 8, row 7, column 5, 8). Relapse also correlated with the absence of a partner among unemployed older men with detox<3, but only significantly in clinic A (see row 9, column 6). However, there were no clearly contradictory results. For example, the younger unemployed men with detox<3 in Clinic A were trending (p=.064) to relapse more often if they had a partner (OR: 0.3). In Clinic B the "tendency" is in the opposite direction, but with a minimal effect size (OR: 1.2) and a low probability of error (p=.635) (Table. 8, row 9, column 4).

The sample size of the pensioners only allowed an evaluation of the male persons. Retirees with „detox>2" relapsed more frequently in both clinics if they did not have a partner (A: OR: 19.6, p<.05, N=30; B: OR: 18.2, p=.002, N=38) (no table).

3.2.4 unemployed persons

In both clinics, unemployed patients were the largest group (A: 48.7%; B: 41.4%) and it was the occupational group with the highest recidivism rate (A: 79.2%; B: 74.7%). As with the entire sample, the recidivism rate of unemployed people in both clinics decreased with increasing age: in Clinic A for men from 85.9% to 66.7% and for women from 83.3% to 68.9% ; in Clinic B, men from 81.3% to 63.6% and women from 78.1% to 61.9%. In both clinics, unemployed young and middle-aged men had a significantly higher recidivism rate than employed persons (Table 9, row 3, 4; column 2, 3). In contrast to Clinic A, the significantly increased cross-product quotient of older men and middle-aged women in Clinic B is probably due to the higher relapse rate of employed people in Clinic A. In both clinics, those who were unemployed at the start of treatment differed from those who were employed in several potential prognostic characteristics, particularly in the characteristics of detoxifications >2 and F1 comorbidity (see Table 9, row 6-9).

- Table 9 about here -

4. Discussion

In a similar rehab clinic (A), we wanted to replicate the results of our first study (rehab clinic B) on age- and gender-specific prognosis criteria for relapse or abstinence after completion of inpatient treatment. Our hypothesis is that the conflicting results in the empirical literature are due to differences between treatment facilities, treatment programs, samples, and evaluation methods. Therefore, we compared the results of two treatment facilities that are very similar in terms of facility type, therapy program, and patient recruitment, and we used largely identical evaluation methods. Subsequent evaluations of the data from Clinic B meant that this is not just a replication study, but also a pilot study to generate new hypotheses, including new insights into the methodological procedure.

4.1 Replication study

In our replication study, the results of Clinic A largely agree with those of our previous study (B). There are no conflicting results between the two clinics, even if the significance level had been $p<.10$. In both clinics, younger people and women were treated longer and younger patients were more likely to relapse, regardless of gender. With the exception of the older patients in study B, women did not relapse more frequently than men in either clinic. There are significant prognostic features with at least a medium effect size, mainly in men. In both studies, with the exception of one in Clinic B, there are no significant prognostic features with at least a moderate effect size for the women. This could mean that male relapses are more predictable and would conform to a stereotype about male behavior. However, this similarity may also be due to the smaller sample size of the women in both studies. Another correspondence is that in both clinics, “not being employed” was a significant predictor (compared to “employed”) only among middle-aged men.

There is a similarity between both studies regarding previous addiction treatments. For the older men at Clinic A, previous inpatient detoxification was a significant predictor, whereas for those at Clinic B, previous inpatient rehab was a significant predictor. Another similarity between the results

of both studies is that in clinic B, depression was the strongest predictor among the older women, while in clinic A, mental comorbidity was. Along with tobacco addiction, depression was the most common comorbid diagnosis in both clinics.

But there are two differences between the two clinics in terms of significant results, namely the characteristic of previous addiction treatments. Only in Clinic A was previous detoxification among the younger men and only in Clinic B was previous rehab among middle-aged women a significant predictor. These two differences would persist even if the sample was enlarged, due to a low OR and high p-value in the two parallel groups.

There are no differences in the predictors in the remaining age- and gender-specific group comparisons. However, it cannot be ruled out that further significant predictors could emerge with larger samples.

4.2 Pilot study

To ensure that younger patients and women are better recognized among the on average 47-year-old men, we continued the search for risk groups using stratified cross-tabs as a pilot study. These are groups that are not recognized in the data set of large samples because they are only represented by abstract numbers (such as odds ratio, regression coefficients) or because they can cancel each other out through different combinations of features (46, 47). The cross tables with the formation of subgroups show much more impressively than regression coefficients which patient groups in a clinic could be at risk of recurrence. A cross-product quotient of 3.8 (Table 5) is impressive, but much more thought-provoking is the finding that in one subgroup, 93.3% of the 15 patients, i.e. 14 out of 15, relapsed, although in this age group the average was (only) 58.4% (Table 6). Recidivism rates expressed as a percentage, together with significance values and effect sizes, make it clearer where there is a need for improvement in the care of dependent people, be it for individual treatment facilities or types of clinics or for people dependent on alcohol in general.

Unemployment

Even though not working was only of minor importance in the binary logistic regressions in the majority of gender-specific age groups, the stratified cross tables show the importance of employment for successful therapy. Unemployed younger and middle-aged men in particular were more likely to relapse in both clinics. As these two groups also differed from the employed in other prognostically relevant characteristics, it was not possible to analyze the extent to which previous detoxification, psychological comorbidity or other characteristics were decisive for the low abstinence rates of the unemployed persons due to the small samples. In addition, our study design does not allow analysis of the causes and consequences or interactions between these characteristics. Despite ignorance of the relevant influencing factors, the results strengthen the importance of measures to maintain or restore employability (48, 49).

Previous detoxifications

In Clinic B, previous drug-rehab, rather than detoxification, correlated with relapse. In Clinic A it was exactly the opposite. A subsequent analysis of the characteristic detoxification using layered cross-tabulations showed that detoxification is also prognostically significant in Clinic B, in contradiction to the results of the binary logistic regressions. The fact that the relapse-promoting effect of previous detoxification was not attenuated by other characteristics, with the exception of employment in Clinic B, illustrates, in contrast to the results of the binary logistic regressions, the high prognostic value of this characteristic, especially when the number of previous detoxifications is in the top quartile (Q3=5). The proportion of people with more than two detoxifications was so high in all six gender-specific age groups (>33%) that there should be an increased need for research in this regard. It would have to be clarified to what extent biological (e.g. addiction memory, (50)) or psychological influencing factors (e.g. self efficacy, (51)) play a role in people

with previous detoxifications in order to derive pharmacotherapeutic and psychotherapeutic interventions. In addition, it should be examined whether interventions can already be developed in the detoxification wards that go beyond the motivating measures for withdrawal treatment, especially for patients with repeated admissions.

Partner situation

Isolated cross product quotients from the binary logistic regressions and some trend results from the stratified cross tables of both clinics suggest that a partner relationship can promote relapse in women, but promote abstinence in men. However, this does not seem to be the case if several detoxifications have already taken place. Either life is so strongly controlled by dependency that partner relationships are meaningless or effects of the partner situation are difficult to measure because they are overshadowed by other characteristics. Our results suggest that unemployment, number of detoxifications and psychological comorbidity interact to influence relationship behavior in partner situations, which can promote abstinence or relapse.

For younger unemployed men, it is conceivable that they are more likely to live with a partner who has alcohol problems themselves, or that unemployment has a stressful effect on the partner relationship, which increases the likelihood of relapse. For middle-aged women, it is conceivable that they could find themselves in a difficult social situation because of a partner relationship. For example, according to old role clichés, there may be a dependent relationship with the partner (52, 53), but on the other hand, the partner himself may be dependent (54, 55) or the partner may be violent (56). The extent to which these hypotheses apply cannot be answered here because we lack more differentiated data on the partner situation and larger samples. However, the results speak for the inclusion of relatives in the treatment and for better documentation of partner and family relationships.

In **summary**, the replication and pilot study shows that there are many similarities between the results of the two similar clinics. There is not a single result that contradicts a significant predictor from the other clinic. If there are differences, they are limited to significant results in one institution and a non-significant trend in the other institution. The results support Badinter's hypothesis that the differences in different life situations are greater than the differences between women and men (57). Research and therapies should not be limited to a gender differentiation, but should also take into account the life situation, which may have a stronger influence on the results than gender. In particular, there is an increased need for research into the situation of younger women and men, a group that has been neglected to date.

4.3 Limitations

A field study carried out retrospectively as part of quality management without financial research funding has high external but low internal validity. Unfortunately, there are a number of limitations, so our study only contains suggestions for the further search for predictors. When interpreting the results, it should be borne in mind that this is a small group of alcohol-dependent people who are willing to undergo inpatient treatment for at least two to four months with the goal of abstinence. The prognostic characteristics found only relate to this small group with a further restriction due to the therapy program: treatment based on behavioral therapy. The extent to which the results of this study also apply to other types of clinics would have to be examined through replication studies before attempting to arrive at more general statements.

The consideration of other potential prognostic characteristics within the framework of the biopsychosocial (3) or the socioecological model (58) would have been desirable in our study, but is not feasible with our sample sizes. Another limitation is the sample, predominantly middle-aged male patients, which made it difficult to form subgroups by including other patient characteristics.

Therefore, we have not been able to adequately analyze predictors of previously neglected groups of inpatient treatment.

The data was collected more than 10 years ago. Therapies may have improved considerably in the meantime, meaning that the results are no longer up to date. On the other hand, the disadvantage of using previously unpublished old data can be offset by the inclusion of new scientific and social insights, which can have a positive impact on the research question, evaluation and interpretation. The data collected by the clinic in the years 2011 - 2014 were evaluated in 2023 and compared with the literature from the years 1970 - 2023. Even the inclusion of the latest literature on socio-demographic and clinical predictors of relapse or abstinence shows that the results are still up to date in our estimation.

Continuous abstinence as a goal of therapy is our measure of success only for methodological reasons, and not a plea for this very demanding desired goal, because we expect better validity of the abstinence measure of success from the question about continuous abstinence and from the question about the time of the first consumption of a psychotropic substance after the end of the treatment than with the question about the last four weeks.

Another limitation of our study is the formation of age groups based on chronic age and not on age-specific developmental tasks. Unfortunately, an analysis of the under 30-year-olds was not possible because the sample size was too small. The validity of our study is also limited by the unknown individual therapy planning in both clinics, the different sizes of the samples and by the type of follow-up survey and the high proportion of patients who were not known to the follow-up. On the latter point, however, it is interesting to compare the results of calculation methods QACC12m and QATP12m for binary logistic regression (Table 5) and for the stratified crosstabulations (Table 6, 7). The results of both calculation methods are so similar that the limitations of too small samples can be avoided when searching for prognostic features if all unknown patients are classified as relapsed. A prerequisite for this procedure, which should be limited to the quality management of small

institutions, is probably that the proportion of patients who are known from the catamnestic is at least around 50% and the patients without follow-up should have significantly more unfavorable prognosis features.

The results of the repeated evaluations with the same sample and the evaluations with overlapping subgroups must not be understood as a measure of validity. This procedure only served to identify interactions between potential prognostic features and to generate hypotheses for further studies. Comparing the results of the binary logistic regressions, the univariate crosstabs and the layered crosstabs, it becomes impressively clear how strongly the identification of potential predictors is influenced by the composition of the sample characteristics and by the analysis methods.

Our design only allows the identification of significant prognostic features with moderate effect sizes and does not allow the exclusion of features since no beta error probability can be determined by our non-specific hypotheses. It is therefore easy to imagine that larger samples in the women would have made other characteristics relevant for the prognosis. In Clinic A, this could most likely apply to mental comorbidity and in Clinic B to depression, which in turn would be a commonality between the two studies.

Regardless of these limitations and the problems of interpretation, our results highlight the need for age- and gender-sensitive research and treatment. We are not aware of any study in which abstinence or relapse rates after inpatient drug rehab and their predictors were repeatedly analyzed in terms of gender and age. We suspect that even in an international comparison, prognostic criteria no longer differ or differ only slightly, even between North American and German studies, when the analyzes are carried out separately for similar therapy programs.

4.4 Conclusions for practice.

Despite the methodological problems and the limitations, our results contain suggestions for similar therapy programs. The results speak for a very individual therapy tailored to the patient's situation. In the case of unemployed patients, stronger support with regard to professional matters might be helpful, in the case of patients with previous detoxifications, pharmacotherapeutic treatment and a strengthening of self-efficacy for abstinence. Strategies for coping with loneliness may be helpful for pensioners without a partner. For younger patients and for women with a partner an analysis of partner-related risk situations may be recommendable. Our results, if they are correct, also support keeping alcohol-dependent persons in employment as far as is reasonable and intervening very early, before dismissal is necessary, in order to then restore employability within the framework of therapy. These are just ideas that require further replication studies and better documentation of the characteristics, especially the living conditions of the patients and the quality of the partner relationships.

But first and foremost, there is a great need for research and therapeutic action to improve therapies for younger women and men, a group who still have a long and fulfilling life ahead of them if we can help them better than has unfortunately been the case for decades.

Acknowledgments

I thank all patients who agreed to participate in the pseudonymised study and especially those who participated in the follow-up examinations. I would like to thank the online services of pubmed, google scholar and the Bavarian State Library in Munich for using them free of charge for my literature research.

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