

Treating Alcohol and Drug Abuse

An Evidence Based Review

Edited by

Mats Berglund, Sten Thelander, Egon Jonsson



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Preface (Background and Methodology)

Evidence Based Medicine and the Swedish Council on Technology Assessment in Health Care

Like many other governments in the early 1980s, the government of Sweden faced an accelerating number of emerging technologies and medical innovations that were being incorporated into its health care system. The consequent (and alarming) increase in the cost of health care became an urgent concern. This situation led in 1987 to the founding of the Swedish Council on Technology Assessment in Health Care (the official acronym is SBU).

As its name implies, SBU assesses the technologies and methods used in providing health services. These assessments are systematic evaluations that summarize the medical and scientific literature from around the world. Leading experts, mostly from Sweden but also from other countries, are involved in conducting and reviewing the SBU assessment projects.

While striving to keep the needs of the patient (the whole patient) at the center of health care planning, each assessment project investigates not only the medical aspects of a treatment option, but also its economic, social, and ethical aspects.

Assessment projects aim to identify the most effective and, if possible, the most cost-effective interventions. They also aim to identify the technologies already in use that are not adequately supported by scientific evidence. Assessment findings can be used by clinicians, administrators, and policy makers to assure the most appropriate allocation of the limited resources available to health care.

A Project Group comprising 13 investigators, including a statistician, was selected to assess the wealth of scientific literature on the treatment of alcohol and drug problems. The Group performed the initial, integrated literature search with guidance from a specially trained librarian. A checklist for rating quality was developed, based on already available instruments. Meta-analytic techniques were optional, but were applied where possible. In most areas it was possible to draw conclusions based solely on randomized controlled trials (RCTs).

Based on the completed reviews and guided by comments from several external reviewers, the Chair of the Project Group and SBU staff members wrote an Executive Summary. The SBU Board of Directors and the SBU Scientific Advisory Committee approved the Summary and Conclusions.

The scope of the SBU review was extremely comprehensive, covering all clinically relevant RCTs in the fields of alcohol and narcotics. Because of the large number of studies, the detailed type of analysis often found in a Cochrane review of a small and narrowly defined area was not possible.

Quality Assessment

Many methods for assessing the quality of studies have been described, ranging from a few basic aspects to elaborate scales with weighting of the individual items.

The purpose of quality rating is to identify sources of bias, which could endanger the results of the study. In many cases, aspects of external validity or generalizability are also included in the quality assessment.

The empirical value of quality assessment remains uncertain. Some, but not all, studies have found larger effects when randomization was unreliable, blinding was not accomplished, or noncompleters were unaccounted for.

Our checklist was developed on the basis of already available checklists, and included items related to both internal and external validity. Each item could score from 1 to 3, with 3 representing the highest quality. A scoring manual was also developed. The maximum score possible was 30 for individual studies and 33 for multicenter studies.

The summary score was primarily used as a qualitative measure, and was never used to exclude studies or to give them different weights in the meta-analyses.

Because of time constraints, not all studies were read by two independent readers. This is a potential source of bias. In an attempt to reduce this risk, studies selected via a random sample were read by each member of the Project Group, and a consensus was reached concerning ratings of the different items. Most large and new studies were read by several members of the Project Group.

Meta-analytic Procedures

The use of formal meta-analytic procedures was optional, but was to a considerable extent related to the quantity or quality of studies in the areas reviewed. Meta-analyses were performed in the chapters on psychosocial treatment of alcohol dependence and drug dependence and in those on medication for drug dependence, and on some treatments in the chapter on medication for alcohol dependence. Meta-analyses were not performed in the other chapters.

We decided to use the standardized mean difference effect sizes as the general outcome measure throughout the entire report, with very few exceptions. The Hedges correction was used (Hedges and Olkin, 1985) to adjust for small sample size bias. The correction factor is $1 - [3/(4n - 9)]$, where n equals the total number of participants.

Although no strict clinical interpretation of effect sizes is agreed upon, many apply the convention that 0.2 is a small but relevant effect, 0.5 a moderate effect, and 0.8 a large effect.

For categorical data we first calculated the odds ratio and then transformed it to *d* according to Shadish and Haddock (1994).

Intention-to-treat analysis (ITT) was applied when the primary outcome was calculated. We defined intention-to-treat as all patients randomized. If intention-to-treat results were not available, an attempt was made to recalculate the figures (presented in the individual study section). If an ITT analysis was not possible, we used the results of the completers analysis.

Outcome variables as similar as possible were used in the separate chapters of the analysis. The outcomes could vary among the chapters and also for different analyses within a chapter. The main variables were the abstinence rate and the number of abstinence days in the alcohol section. Some analyses used the rate of return to heavy drinking and number of heavy drinking days. In the chapters on drug dependence, two outcome variables were used concurrently. Those variables were abuse and retention rate in treatment programs.

In most studies, especially the older studies on alcohol, no primary outcome variable was defined. Generally, the choice of outcome variables was made as similar as possible for the different studies in the separate analyses.

In most of the studies that used pharmacological treatment, the outcome was defined as that at the end of the treatment period. Analysis was generally performed without attempts to standardize the duration of treatment. The psychosocial treatment studies usually used outcome after a follow-up period. The period was chosen to be as constant as possible for the different studies in the separate analyses.

Aggregated effect sizes were computed with the Comprehensive Meta-analysis Software Program (Borenstein et al., 1998). The different meta-analytic calculations were tested for heterogeneity using the same program. If the studies were homogenous, a fixed model was used. If, however, heterogeneity was present, a search for moderator effects was initially performed. If no obvious moderator could be identified, the results of a random-effects model were presented in addition to those from the fixed-effects model. The moderators were tested for significances using the same meta-analytic program.

Publication bias is always a reason for concern. The simple, but not completely reliable, funnel-plot methodology was used in the meta-analyses of psychosocial interventions for drug dependence. No signs of publication bias were evident in the opiate studies, and a slight tendency was found in the cocaine studies.

English Edition

The English language edition of the report presented here includes papers that were published after the Project Group had completed their literature search for the Swedish edition. Most of the chapters include the new papers as an addendum. In the chapter on pharmacotherapy of alcohol dependence, however, the new papers have been integrated in the text. The meta-analytic methodology has been refined and developed (Borenstein et al., 1998). Some inadequate calculations

of effect sizes in the original Swedish version have been corrected. Because of the lack of evidence for cost-effectiveness of particular interventions, a section on economic aspects that appeared in the Swedish version has been excluded in the English edition.

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Borenstein M, Rothstein H. *Comprehensive Meta Analysis. A Computer Program for Systematic Reviews*. Biostat™, Englewood, 1998.

Hedges LV, Olkin I. *Statistical methods for meta-analysis*. Orlando, Fl., Academic Press, 1985.

Shadish WR, Haddock KC. Combining estimates of effect size. In: Cooper H, & Hedges EV (Eds): *The handbook of research synthesis*. New York, Russel Sage Foundations pp. 26-281, 1994.

Treating Alcohol and Drug Abuse – An Evidence Based Review

Foreword by Henry R. Kranzler, M. D.

It is a challenge to provide a suitable introduction for a work as ambitious as that undertaken here by The Swedish Council on Technology Assessment in Health Care (SBU). The Council and the contributors to this volume are to be commended for their diligence, hard work, and courage in bringing to fruition an effort of this magnitude. The numerous scientific reviewers of the work also deserve credit for their important contribution.

For much of its history, the field of alcohol and drug abuse treatment has been steeped in lore and tradition. Empirical research has not been seen as a necessary basis for clinical practice in this area. During the past decade, however, interest in evidence-based practice in medicine generally and the increasing “medicalization” of substance abuse treatment have led to a greater emphasis on the scientific method to generate practice guidelines for the diagnosis and treatment of addictive disorders. Most notably, the randomized clinical trial has become the agreed-upon standard in substance abuse treatment research. In large measure, however, evidence-based treatments for substance use disorders have lagged behind the treatment of other disorders, including psychiatric disorders such as schizophrenia and mood disorders. The current volume, which is comprehensive and detailed, should help to narrow this gap.

The volume, consisting of 10 chapters, covers a full range of topics in alcohol and drug abuse treatment. It begins with a review of interventions for hazardous drinking. The pharmacological treatment of alcohol withdrawal is covered next. Separate chapters on the psychosocial and pharmacological treatment of alcoholism follow. A chapter on the long-term course of alcohol and drug dependence provides the transition to four chapters on the treatment of drug dependence. As is true for alcohol dependence, there is a separate chapter on psychosocial treatments for drug dependence. Three chapters on the pharmacological treatment of drug dependence (i.e., treatment of opioid withdrawal, treatment of opioid dependence and treatment of cocaine dependence) follow. A final chapter reviews the literature on substance abuse during pregnancy and the neonatal period. Three appendices provide a list of the contributors and scientific reviewers, the criteria used to rate the quality of the articles reviewed and guidelines employed to estimate effect size.

This volume is an English translation of the work that was originally published in Swedish. Not all reviewers of the Swedish version of this *magnum opus* agree that the volume is as important a contribution as I believe it to be. Poikolainen (2002) criticized the Swedish version of this work as containing errors that cast doubt on the validity of the main findings. Although many of the problems attributed to the Swedish version of the review have been corrected in the English translation, the impact on the main findings of those corrections was not great, arguing against the criticism leveled by Poikolainen.

I believe that this volume should be required reading for anyone who seeks to be knowledgeable in the treatment of alcohol and drug dependence. Although the summary and conclusions can be read rather easily, it is clear that the overview provided by that brief section serves only to orient the reader. The full measure of this work is in the detailed information that is contained in the 10 chapters that follow.

Reference

Poikolainen, K. A nice try that fails: The Swedish Council on Technology Assessment in Health Care (SBU) evaluation of the effect of treatment of alcohol and drug problems: The epidemiologist's view. *Alcohol & Alcoholism* 37:416–418, 2002.

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Intervention against Hazardous Alcohol Consumption – Secondary Prevention of Alcohol Problems

Mikko Salaspuro

1.1

Introduction

Secondary prevention of alcohol problems covers the methods used for early detection and treatment of people with excessive alcohol consumption. The methods aim at preventing the development of alcohol dependence and alcohol-related diseases and injuries. Problem drinking is detected either in primary care or at a hospital by means of screening methods including questionnaires and laboratory tests. Preventive methods are referred to as brief interventions. Brief intervention is based on knowledge about alcohol being a major social and health problem, which reinforces the need to develop new strategies for primary and secondary prevention. Early detection of risk drinking is of central importance to the intervention. When an alcohol problem is detected, the patient receives information about the harmful effects which alcohol abuse or high alcohol consumption may cause. This is followed by a motivational discussion to reduce alcohol consumption. Brief intervention may also involve written advice and followup visits. Table 1.1 presents the framework of brief intervention (FRAMES) as described by Bien et al. [8].

Table 1.1. Content of brief interventions, FRAMES.

<i>Feedback</i> of personal risk or impairment	Feedback and information about alcohol is given in relation to the patient's problems and symptoms.
Emphasis on personal <i>responsibility</i> for change	The patient's decision to reduce the drinking should be his/her own.
Clear <i>advice</i> to change	The decision to reduce or quit drinking should be supported.
A <i>menu</i> of alternative change options	Alternative strategies to reduce drinking are created.
Therapeutic <i>empathy</i> as a counseling style	The interventions are carried out in a warm, reflective, empathetic, and understanding manner.
Enhancement of client <i>self-efficacy</i> or optimism	Self-trust and optimism concerning success is encouraged.

1.2

Aim

The aim of this systematic review of the literature is to review all published, randomized controlled trials (RCTs) as a basis for drawing conclusions about the effect of brief (minimal) interventions on alcohol consumption and alcohol-related problems.

1.3

Methods

1.3.1

Selection of Studies, Inclusion and Exclusion Criteria

The randomized controlled studies available in the field were systematically reviewed. Some studies included not only people with hazardous consumption levels but also alcohol-dependent individuals. However, the studies that analyzed alcohol dependence exclusively have been excluded. Also excluded were studies undertaken within the framework of substance abuse services or those where participants were recruited by advertising. Furthermore, this review excluded studies which compared brief intervention with more intensive treatment, and studies where the intervention extended beyond what is usual for a brief intervention. No requirements were established concerning the minimally acceptable followup time or the type of staff that performed the intervention.

1.3.2

Search Strategy

The search of the literature for this chapter was limited to MEDLINE from 1966 through 2000, but has been updated more recently to include some of the most important new studies or reviews on the topic. The following search terms were used in combination (number of identified publications are given in parentheses):

- Heavy drinking and intervention (36); – and advice (11)
- Brief intervention and alcohol (52)
- Counseling and alcohol and controlled study (2)
- Intervention and problem drinking (47); – and controlled drinking (5); – and problem drinker (10); – and alcohol consumption and controlled trial (17); – and alcohol and general practitioner (14)
- Intervention and problem drinkers (62)
- Advice and alcohol consumption (91)
- Early intervention and alcohol (104); – and controlled study (2)
- General practitioner intervention (9)
- Alcohol and intervention and controlled trial (44)
- Alcoholism and intervention and controlled trial (19).

Bibliographies from the studies found and from previously published meta-analyses, literature reviews, and dissertations were also reviewed [3, 7, 12, 20, 23, 33, 34, 35, 42, 46, 47].

1.3.3

Outcome Measures

The most important outcome measures applied in the studies were changes in (a) alcohol consumption and (b) alcohol-related problems. Other outcome measures were: changes in laboratory values (GGT, AST, blood alcohol level, MCV), number of sick days, hospital in-patient days, physical or mental illness.

1.3.4

Rating Scientific Quality

The following were considered in rating the quality of the selected articles: randomization, blinding, patient recruitment and selection, criteria for diagnosis and selection, type of control treatment, dropout analysis and documentation on outcome estimates, outcome measures, multicenter studies, delivery of treatment, reporting of the total treatment situation, and statistical methods.

1.3.5

Analyzing the Results

The percentage of individuals in the intervention and control groups who reduced their alcohol consumption to a moderate or more risk-free level was calculated in all studies where this was possible. This information was used to estimate the relative risk reduction (RRR), the absolute risk reduction (ARR), and the number needed to treat (NNT), i.e., the number of heavy drinkers who would need brief intervention to enable each one to reduce his/her alcohol consumption to a more risk-free level [38]. Furthermore, the 95% confidence interval for each NNT was calculated [38].

1.4

Results

1.4.1

Literature Search

The search of the database and bibliographies in previously published meta-analyses, reviews, and dissertations identified 478 articles. Of these, 27 studies fulfilled the inclusion criteria established by the group. The studies which were excluded usually focused on comparisons between different forms of therapy for alcohol dependence (as discussed above). The absence of a control group or lack of randomization were other reasons for excluding a study.

1.4.2

Previous Reviews and Meta-Analysis

Six systematic and several less comprehensive literature reviews addressed studies of brief interventions [7, 8, 12, 20, 21, 23, 29, 30, 33–35, 42, 46, 47]. The second edition of Hester and Miller's book on the treatment of alcoholism [20] is based on a systematic evaluation of the literature. Only randomized and case-control studies were included. The review covered 211 studies of which 149 (69%) reported a significant outcome. Twenty-three studies from 1977 to 1992 which addressed brief interventions are included in the review. The analysis by the authors found stronger support for a good outcome from brief intervention than from any other form of treatment. However, Hester and Miller also included studies that compared brief intervention with more intensive forms of treatment, studies that had been performed outside of the standard health care organization, and studies where advertising had been used to recruit problem drinkers. Furthermore, some studies included in the present review were missing in Hester and Miller's book.

Kahan et al. used almost the same inclusion criteria as those used in this review. Eleven studies fulfilled these criteria, but the search strategy failed to identify all randomized studies [23]. The authors concluded that the studies supported the effectiveness of brief intervention. However, they stated that further studies were needed to investigate the effects of brief intervention on morbidity and mortality. Furthermore, uncertainty remained concerning the most suitable patients for intervention, the optimum intensity of intervention, and the most effective components of the brief intervention. Further studies were also found to be necessary to develop strategies to effectively motivate health care staff to use the method.

In 1997, Wilk et al. published a meta-analysis of randomized controlled studies of brief intervention in heavy drinkers [47]. Their analysis included 12 randomized studies that fulfilled the inclusion criteria. The quality of the articles was comparable to equivalent studies in other research areas. The authors concluded that heavy drinkers who were subjected to minimal intervention were twice as likely to reduce their alcohol consumption to a more moderate level 6 to 12 months after the intervention compared to the control group which was not exposed to an intervention.

The outcome was independent of patient gender, intervention intensity, and type of organization. The authors concluded that brief intervention is an inexpensive and effective preventive method for treating heavy drinkers of alcohol who are identified through the health services.

A review by Ashenden included studies investigating the effect from different intervention methods on lifestyle changes [7]. The review also included studies which, in addition to alcohol consumption, also addressed patients' smoking, diet, and exercise habits. In this review, the effect on alcohol consumption was analyzed in only six studies, of which one was nonrandomized. The authors concluded that further studies are needed before any conclusions can be drawn concerning the most effective interventions and the magnitude of the effect.

Poikolainen performed a meta-analysis of primary care studies in which he compared brief intervention (5–20 min) to a more extensive intervention (repeated followup visits) [33]. Seven studies were included in the analysis. The outcome measure was a quantitative change in alcohol intake. The brief intervention showed no confirmed effects in either men or women. The more intensive intervention led to a significant reduction in alcohol consumption in women but not in men. Because of the differences in design between the different studies it was not possible to claim that the demonstrated difference in alcohol consumption would apply more generally. The author(s) concluded that further studies are needed to investigate why some interventions yield better results than others.

Moyer et al. included two types of studies in their meta-analytic review [27]: studies comparing brief interventions with control conditions in nontreatment-seeking samples ($n=34$) and those comparing brief interventions with extended treatment in treatment-seeking samples. In studies of the first type, small to medium aggregate effect sizes favoring brief interventions emerged across different followup points. In contrast to this SBU review, the meta-analysis by Moyer et al. also included one study on alcoholics with gastrointestinal disease and five studies (one thesis) that had not been detected in the present literature search or accepted in the final review. Furthermore, Moyer's review included, as separate entities, nine studies from the collaborative WHO project, which the present review includes as a single entity [45]. On the other hand, Moyer's review failed to identify nine RCTs on brief intervention that have been included in this report. Nevertheless, the conclusions of these two reviews are largely the same.

1.4.3

Randomized and Controlled Studies

Table 1.2 (see page 6–15) shows characteristic features of the selected 27 randomized controlled studies addressing secondary prevention (brief) in heavy alcohol consumption and alcohol problems, including the number of patients, inclusion and exclusion criteria, type of intervention, followup time, quality rating, main outcome measures, and positive or negative effect. In these 27 studies, 9965 patients (approximately 8000 men and 2000 women) were randomized to intervention or brief intervention groups, brief information groups, investigation groups, or

Table 1.2. Randomized and controlled studies addressing secondary prevention of alcohol problems.

Article, year, care setting	Population, gender, mean age	Inclusion criteria	Exclusion criteria
Anderson and Scott [3] 1992 Primary care	N=154 men 7 community health centers, 44 years	>350 g of alcohol/w	>1050 g of alcohol/w, previous counseling
Anti-Poika et al. [4] 1988 Hospital	N=120 men Trauma patients in the surgical unit, 38 years	MAST \geq 7	Severe head injuries
Chick et al. [8] 1985 Hospital	N=156 men Different medical units, 18–65 years	>50 dr/w, alcohol problems	Homeless, demented, severe illness, previous referral to psychiatrist
Córdoba et al. [9] 1998 Primary care	N=229 men 33 community health centers, 37 years	>36 dr (8 g)/w or >10 dr/day during 1 month	Previous advice to reduce, chronic illness
Cushman et al. [10] 1998 Primary care	N=641 636 men, 5 women, 58 years	\geq 3 dr/day during 6 months, diastolic RR 80–99	Alcohol dependence, drug addiction, severe illness
Elvy et al. [12] 1988 Hospital	N=263 168 men, 32 women Surgical units, 29 years	CAST questionnaire \geq 3	Alcoholics, home outside the district
Fleming et al. [13] 1997 64 family practitioners in 17 community health centers Primary care	N=774 482 men 292 women 59.4% = 18–40 years 41.6% = 41–65 years	Men >168 g, Women >132 g/w	<18 or >65 years, previous problems with alcohol, >50 dr/w

Legend see page 14.

<i>Intervention</i>	<i>Followup period and %</i>	<i>Quality score</i>	<i>Outcome measure</i>	<i>Effect +/-</i>
Control vs brief counseling (10 min) + laboratory tests + book	12 months (65%)	31/33	Alcohol consumption: ↓ IV 45%, C 27%, difference: -65 g/w, p<0.05	+
Control vs brief counseling + book + repeat at 1-3 times	6 months (74%)	24/30	Alcohol consumption: ↓↑ IV -58%, C +11%, IV -505 g/w, C +73 g/w, p<0.05 Difference: 578 g Improvement: IV 45%, C 20%	+
Control vs intervention (60 min) + book	12 months (83%)	27/30	Alcohol consumption: ↓ IV -296 g, C -272 g, difference: -24 g Improvement: IV 52%, C 34% GGT ↓	+
Brief counseling (5 min) vs intervention (15 min) + book + 1.54 followup visits	12 months (45%)	27/33	Alcohol consumption: ↓ IV -67.3%, C -44%, <21 doses/w: IV 46%, C 24%	+
Control vs cognitive behavior therapy with the goal: ≤ 2dr/day or 50% reduction of alcohol consumption	3, 6, 12, 18, 24 months, (86%, 84%, 80%, 64%)	33/33	Alcohol consumption: ↓ IV -202 g, C -78 g, p<0.01, GGT: ↓ IV >C, p<0.05	+
Control vs brief intervention with the aim to make the patient accept a referral to an alcohol counselor	12 and 18 months (74% and 61%)	27/33	IV vs C: fewer alcohol problems, longer time from last drink	+
Control (30 min interview + book with general health information) vs 2 brief counseling sessions (15 min) + book	12 months (93%)	32/33	Alcohol consumption: ↓ IV 40%; C 18%, moderation: IV 63%; C 32% men: IV -97 g/w, C -61 g/w, women: IV -85 g/w, C -30 g/w, Days in hospital ↓	+

(Table continues on next page)

Table 1.2. (cont.)

<i>Article, year, care setting</i>	<i>Population, gender, mean age</i>	<i>Inclusion criteria</i>	<i>Exclusion criteria</i>
Fleming et al. [14] 1999 Primary care	N=158 105 men, 53 women, all over 65 years of age	Men >132 g/w, or >4 dr >2x/3 month, women >96 g/w, or >3 dr x >2/3 month + >2 CAGE positive answers	Alcoholics, previous counseling, suicidal thoughts, under 65 years of age
Gentiello et al. [16] 1999 Hospital	N=762 579 men 183 women trauma patients, 35–37 years	Elevated blood alcohol, SMAST >1–3, elevated GGT	<18 years, mental illness, homeless, severe head injury, <24 hours in hospital
Heather et al. [18] 1987 16 general practi- tioners Primary care	N=104 78 men 26 women, 36 years	Men >35 dr/w, women >20 dr/w, or alcohol problems	Alcoholism, severe mental illness, liver disease
Israel et al. [21] 1996 42 general practi- tioners Primary care	N=105 age not reported	One positive response in a trauma questionnaire	Alcoholism, GGT >200, mental illness, AA, drug addiction
Kristenson et al. [23] 1983 Department of preventive medicine Hospital	N=473 men, 48–50 years	GGT >1.40 mkat/l	Hypertension, hyperlipidemia, diabetes
Lang et al. [24] 1995 14 company- based physicians Primary care	N=129 95% men, 43 years	RR >140/90 and GGT 1.5 x upper limit for normal level	Severe illness, non-alcohol cause of GGT

Legend see page 14.