INTRODUCTION

Medical, psychological and social problems related to the frequent use of alcohol (Cornel et al., 1990) are common among patients seen in a hospital setting for reasons other than drinking. The prevalence of drinking above health limits in combination with medical and psychosocial problems varies from 4 to 22% (Persson and Magnusson, 1987; Orford et al., 1992). Although professionals in specialized health care are aware of the harmful physical effects of problematic alcohol use, they still find it difficult to detect and treat alcohol-related problems (Kaariainen et al., 2001).

In primary health care, brief psychosocial interventions offered at an early stage assist patients in reducing problem drinking (Poikolainen, 1999; Ballesteros et al., 2004). Less is known about the effectiveness of these interventions in the hospital setting. In a systematic review evaluating eight hospital intervention studies (Emmen et al., 2004a), we found only one study showing a significant reduction in alcohol consumption. This study was carried out among referred outpatients with a relatively intensive intervention and a short follow-up period (Maheswaran et al., 1992). None of the other studies found significant effects on reported drinking (Chick et al., 1985; Elvy et al., 1988; Persson and Magnusson, 1989; Rowland and Maynard, 1993; Heather et al., 1996; Welte et al., 1998; Watson, 1999). Although some studies in the hospital setting, among self-referred injured patients, did report positive effects (Antti-Poika et al., 1988; Gentilello et al., 1999; Smith et al., 2003), the majority of problem drinkers identified opportunistically in the hospital setting may not be ready to change their drinking behaviour. These patients might nevertheless profit from a brief motivational intervention (Heather et al., 1996). Brief motivational interventions aim to increase the awareness of alcohol-related problems and enhance the motivation to change, and are generally found to be effective (Noonan and Moyers, 1997; Miller and Wilbourne, 2002).

Given the high prevalence of problem drinking in hospital patients, the low number of methodologically sound studies in this setting and the positive effects of brief motivational interventions, this study aimed to evaluate its effects in a randomized controlled trial among outpatients in a hospital setting. It was hypothesized that such an intervention would reduce alcohol consumption and increase the motivation to change.

PATIENTS AND METHODS

Screening

During three years (from April 2000 until March 2003) all new patients from a general internal medicine outpatient clinic of the University Hospital in Nijmegen were screened by their physicians using the first three questions from a Rasch homogeneous scale (interval scale) measuring the severity of problem drinking among patients (Cornel et al., 1994). The questions were: (i) Have you ever felt the need to cut down on your drinking? (ii) Do you ever drink to forget your worries? (iii) Do close relatives ever worry or complain about your drinking? Patients were identified as problem drinkers if they answered affirmatively to at least one of these questions. Patients were also included in the study if the physicians suspected them of having drinking problems based on signs of excessive alcohol consumption such as alcohol breath, somatic symptoms which indicate alcohol abuse, specific liver function disturbances or mention of excessive alcohol consumption by the referring physician. Exclusion criteria were: acute or terminal illness, evidence of gross neuropsychological dysfunction, major psychiatric disturbance, not understanding or speaking Dutch, unable to read or younger than 17 years. Patients screened positive or suspected of having drinking problems were asked by their physician to participate in a lifestyle assessment.
Lifestyle assessment

The assessment, assisted by a nurse, consisted of completing a computer-administered questionnaire of ~20 min and collecting a blood sample for biochemical analysis. The lifestyle questionnaire included demographic questions and questions about smoking, exercise, diet and the consumption of alcohol. Although the questions on alcohol consumption were the main interest, other lifestyle questions were used to mask them.

The measure of alcohol consumption used was a modified version of the second AUDIT alcohol consumption question (Babor et al., 1989; Bradley et al., 1998; Bush et al., 1998), which covered the quantity of drinking. As most patients are used to drinking more, or perhaps only, during the weekends, we modified the question by adding the response option ‘none’ and by asking them about the average number of glasses of alcohol they drank on a usual working day and on a usual weekend day. Patients could choose from six drinking categories: none, 1–2 glasses, 3–4 glasses, 5–6 glasses, 7–9 glasses and >10 glasses. The answers were transformed to glasses a day according to the calculations used by Bradley et al. (1998). The number of units was multiplied by 5 for weekdays and by 2 for weekend days to obtain the number of glasses a week. The questions were asked for an average week during the previous month.

Serum carbohydrate-deficient transferrin (CDT) was measured using microcolumn ion-exchange separation of the transferrin isoforms and quantification of the CDT isoforms by turbidimetric measurement (Axis Biochemicals AS), and the results were presented as the percentage of the amount of total transferrin. CDT is recognized as a reliable marker of high alcohol consumption (Stibler, 1991).

Informed consent

After completion of the lifestyle assessment, a nurse informed the patients about the randomized controlled trial. All patients gave written informed consent to a protocol approved by the hospital ethics committee.

Pretest assessment

The lifestyle questionnaire and collected blood samples were the baseline measurement for drinking. Approximately 3 weeks later (often on the day of the next consultation with the physician) the main researcher (M.J.E.) completed the baseline assessment with a computer-administered questionnaire in a face-to-face contact. In the assessment session a computerized version of the second AUDIT alcohol consumption question (Babor et al., 1989; Bradley et al., 1998; Bush et al., 1998), which covered the quantity of drinking. As most patients are used to drinking more, or perhaps only, during the weekends, we modified the question by adding the response option ‘none’ and by asking them about the average number of glasses of alcohol they drank on a usual working day and on a usual weekend day. Patients could choose from six drinking categories: none, 1–2 glasses, 3–4 glasses, 5–6 glasses, 7–9 glasses and >10 glasses. The answers were transformed to glasses a day according to the calculations used by Bradley et al. (1998). The number of units was multiplied by 5 for weekdays and by 2 for weekend days to obtain the number of glasses a week. The questions were asked for an average week during the previous month.

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Follow-up assessment

Six months after the baseline assessment, a non-blind follow-up assessment was performed by the main researcher (M.J.E.). The assessment, including questions on the consumption of alcohol, was administered by self-reported computerized questionnaires in a room where the patient was left alone. After the follow-up assessment, without knowing the results, a WHO Composite International Diagnostic Interview for DSM-IV section alcohol (World Health Organization, 1992) was administered to diagnose alcohol abuse or dependency in the past year and another blood sample was taken.

Alcohol relatedness of medical diagnosis

Starting with a list of medical diagnoses that are considered to be alcohol related, two independent raters analysed the patients’ medical records and categorized the complaints at presentation and the initial diagnostico into four categories: certainly alcohol related, probably alcohol related, possibly alcohol related and not alcohol related. In case of disagreement a consensus was reached after discussion.

Brief motivational intervention

Patients assigned to the control group received usual care, which mostly meant the physician’s confronting advice on a single occasion with occasionally a further reference to the alcohol use at the next consultation. Patients assigned to the brief psychological intervention received the first session of the intervention shortly after the baseline assessment. The intervention was the Dutch Motivational Drinker’s Check-Up (DVA; Doorlichting, Voorlichting Alcoholgebruik) (Schippers et al., 1994a,b; Emmen et al., 2004b). This intervention is modelled after Miller’s Drinker’s Check-Up (DCU) (Miller et al., 1988; Miller and Sovereign, 1989). The DVA is a protocolized brief motivational intervention with an assessment session (90 min) and a feedback session (60 min) given in face-to-face contact by a psychologist. In the assessment session a variety of indicators of alcohol use and alcohol-related problems are sampled and written down in an assessment form. The second session (1 or 2 weeks later) consists of feedback and, if appropriate, advice and ends with a consensus and conclusion. The results are presented orally and on paper by use of a Personal Feedback Report. The style for the feedback session is motivational interviewing, a direct, client-centred style which elicits behaviour change by helping the client to explore and resolve ambivalence (Miller and Rollnick, 1991, 2002), and applies stage-specific strategies according to the Stages of Change model (Prochaska and DiClemente, 1986; Prochaska et al., 1992; Rollnick et al., 1992; Defuentes-Merillas et al., 2002). Subjects were also questioned about treatment elsewhere for psychosocial problems.

Randomization

After baseline assessment all patients were allocated to either a brief motivational intervention or a control group receiving routine hospital care by balanced block randomization. The main researcher (M.J.E) used sealed envelopes to generate the allocation sequence.

Interventionist training and monitoring

Seven psychologists were trained to perform the DVA (Schippers et al., 1994a,b). The first assessment and feedback sessions were audiotaped and discussed with the supervisor and other interventionists. Interveners received individual feedback. Later supervision meetings were used to discuss problematic issues and the personal letters summarizing the DVA results.
Outcome variables
The major outcome measure was change in alcohol consumption. Alcohol consumption is recorded as units/day (1 U = 10 g of ethanol). Change in alcohol consumption is operationalized as a change in self-reported alcohol consumption in U/day from baseline to follow-up. In addition, a change in value of the laboratory indicator of alcohol consumption, CDT, was analysed in order to provide additional evidence of changes in alcohol consumption. Another outcome measure was change in readiness to change drinking behaviour. For those patients who drank above health limits (>3U/day for men and >2U/day for women) at baseline, clinically relevant improvement was defined as a reduction from above to below health limits in accordance with the advice provided by the Royal College of Physicians (Jackson and Beaglehole, 1995). According to power calculations performed before the start of the DCU study, we needed 64 patients for each condition to detect a medium effect (Cohen, 1992).

Statistical analyses
Data were analysed using SPSS for Windows, version 11. Results were analysed on the basis of intention to treat, assuming that the patient who did not attend the follow-up assessment did not change in outcome measures. We analysed baseline variables to describe the different groups and to check for significant differences between the groups. The χ² test of homogeneity was applied to categorical variables or Fisher’s exact test was used when warranted by small sample sizes. Continuous variables were analysed by a t-test. Logarithmic transformations were carried out to normalize data with skewed distributions. We evaluated changes in alcohol consumption from initial to 6 months follow-up assessment by a repeated measure ANOVA. Study groups and assessment occasions were used as independent variables and alcohol consumption at baseline was used as a covariate. Changes in CDT values from baseline to follow-up were also evaluated by a repeated measure ANOVA with CDT at baseline as a covariate. Results on alcohol consumption were verified by examining the proportion of patients who drank above health limits (>3U/day for men and >2U/day for women) at baseline, clinically relevant improvement was defined as a reduction from above to below health limits in accordance with the advice provided by the Royal College of Physicians (Jackson and Beaglehole, 1995). According to power calculations performed before the start of the DCU study, we needed 64 patients for each condition to detect a medium effect (Cohen, 1992).

RESULTS

Study group
The study design and subject losses are shown in Fig. 1. We involved 31 consecutive internal medicine residents in the study, who were expected to see 100–300 new patients each during their internship. The number of patients per physician who screened positive varied from 3 to 31. Although it was formally possible, the inclusion of patients without positive scores on the screening questionnaire was rare.

A total of 4728 patients were screened, of whom 284 (6%) met the criteria for problem drinking. Of these, 107 (38%) refused to participate in the lifestyle assessment. These patients did not differ from those who participated in terms of age [49.9 years (15.22)] and alcohol consumption [3.4 U/day (4.71)]. More women refused to participate (refusers vs participants; 55% female vs 70.6% male, χ² = 7.00, df = 1, P = 0.008). Of the 177 (62%) patients who participated in the lifestyle assessment, 45 (25%) patients refused participation in the trial and 9 (5%) did not show up for the baseline assessment. These non-participating patients had an average consumption of 3.3 U/day. Of the 123 patients randomized: 62 were assigned to the control group and 61 to the DVA group. Table 1 presents the baseline characteristics of these patients.

The intervention and control groups matched well with respect to age, sex distribution and average alcohol consumption. Relatively many patients had professional contacts for psychosocial problems: 21% had been consulting a psychologist in the past half year and 24% used tranquillizers. Only two patients (1%) were actually receiving treatment for alcohol use.

Compliance and fidelity
Two patients did not show up for the intervention at all and two did not show up for the second session. The delivery of the intervention was monitored by checking the DVA Assessment Forms, the Personal Feedback Reports and the letters written to the clients. It could be concluded that all interventions were delivered appropriately.

Treatment deliverers
Four psychologists delivered 91% of the DVAs in almost equal numbers; three others did the remaining 9%. There were no significant differences between the first four psychologists in the average reduction of units a day reported at follow-up by their patients. Outcomes for those patients treated by the two most experienced psychologists did not differ significantly from those of the treated patients as a whole.

Usual care: advice from the physician
Analyses of the patients’ medical records and their answers on the follow-up questionnaire revealed that 50% received advice from their physician. The physicians gave alcohol advice to 96% of the patients with an alcohol-related diagnosis, to 74% of the patients with a diagnosis which was probably alcohol related, to 35% of the patients with a diagnosis which was possibly alcohol related and to 19% of the patients with a diagnosis which was not related to alcohol use. There were no differences in the number of physician interventions given to the intervention and control groups (intervention vs control; 42.6% vs 56.5%, χ² = 2.35, df = 1, P = 0.13).

Follow-up assessment
Follow-up interviews were conducted for 53 patients (86.9%) in the intervention group and 59 patients (95.2%) in the
Mean time to follow-up was 28 weeks (SD = 2.39, range 23–36). Eleven patients (eight DVA and three controls) were lost to follow-up due to refusal (n = 10) or being too ill (n = 1).

Effects of the DVA

Table 2 presents changes in outcome measures for the total sample and subgroups.

Overall, patients reduced their alcohol consumption over time [from 3.9 (2.42) U/day to 3.11 (2.29) U/day; F = 15.43, df = 1, P = 0.001]. There were no significant differences between the groups in reduction in self-reported alcohol consumption (F = 0.55, df = 1, P = 0.46). In line with the results on self-reported alcohol consumption, the repeated measures ANOVA on levels of CDT showed no differences between intervention and control groups (F = 0.16, df = 1, P = 0.69). Verifying the self-reported alcohol consumption by CDT values revealed that 5.2% of the patients at follow-up had much higher CDT values than was to be expected from their self-report. Around 32% of the patients drinking above health limits at follow-up had changed to a higher motivational stage. Although more patients did so in the intervention group, the difference did not reach significance (intervention vs control; 39.3% vs 25.0%, χ² = 2.85, df = 1, P = 0.091).

Of the patients drinking above health limits at baseline, there was a non-significant trend for more in the control group to reduce to safe limits than in the intervention group (OR = 2.34, 95% CI 0.90–6.09, P = 0.08). There was a significantly larger reduction in alcohol consumption in patients with a certainly or probably alcohol-related diagnosis in comparison with patients with a diagnosis which was possibly or not alcohol related (1.67 U/day vs 0.33 U/day; F = 10.24, df = 1, P = 0.002). Analysing the data according to sex or stage of change at baseline, no interactions with intervention/control group were found. Even in the subgroup of the heaviest drinkers no significant differences were found between the two study groups.
BRIEF ALCOHOL INTERVENTION IN THE HOSPITAL SETTING

Table 1. Patient characteristics at baseline for the DVA and control groups

<table>
<thead>
<tr>
<th></th>
<th>DVA group (n = 61)</th>
<th>Control group (n = 62)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient characteristics</td>
<td></td>
<td></td>
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<tr>
<td>Mean age in years (SD)</td>
<td>50.0 (10.6)</td>
<td>47.9 (13.6)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Men n (%)</td>
<td>43 (70.5)</td>
<td>50 (80.6)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Higher education n (%)</td>
<td>25 (41.0)</td>
<td>33 (53.2)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Employed n (%)</td>
<td>33 (54.1)</td>
<td>36 (58.1)</td>
<td>n.s.</td>
</tr>
<tr>
<td>With partner n (%)</td>
<td>52 (85.2)</td>
<td>48 (77.4)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Current smokers n (%)</td>
<td>20 (32.8)</td>
<td>23 (37.1)</td>
<td></td>
</tr>
<tr>
<td>Alcohol-related variables</td>
<td></td>
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<tr>
<td>U/day during the previous month (SD)</td>
<td>4.16 (2.15)</td>
<td>3.70 (2.67)</td>
<td>n.s.</td>
</tr>
<tr>
<td>With recent alcohol dependence n (%)a</td>
<td>9 (16.4)</td>
<td>7 (11.9)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Need to cut down on drinking n (%)a</td>
<td>43 (70.5)</td>
<td>46 (75.4)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Drinking to forget worries n (%)a</td>
<td>23 (37.7)</td>
<td>19 (32.2)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Close relatives worry/complain about drinking n (%)a</td>
<td>29 (47.5)</td>
<td>21 (34.4)</td>
<td></td>
</tr>
<tr>
<td>Medical diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probably or certainly alcohol related n (%)</td>
<td>20 (32.8)</td>
<td>25 (40.3)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Possibly or not alcohol related n (%)</td>
<td>41 (67.2)</td>
<td>37 (59.7)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Laboratory values</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% CDT (SD)</td>
<td>2.55 (0.92)</td>
<td>2.46 (1.18)</td>
<td>n.s.</td>
</tr>
<tr>
<td>CDT above the normal (&gt;2.6%) n (%)</td>
<td>19 (31.1)</td>
<td>11 (17.7)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Stages of changea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the precontemplation stage n (%)</td>
<td>15 (24.6)</td>
<td>17 (28.3)</td>
<td>n.s.</td>
</tr>
<tr>
<td>In the contemplation stage n (%)</td>
<td>21 (34.4)</td>
<td>21 (35.0)</td>
<td>n.s.</td>
</tr>
<tr>
<td>In the action stage n (%)</td>
<td>25 (41.0)</td>
<td>22 (36.7)</td>
<td>n.s.</td>
</tr>
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n.s., not significant.
aFor nine patients data on dependence, for one patient data on the question ‘need to cut down on drinking’, for three patients data on the question ‘drinking to forget worries’, for one patient data on the question ‘close relatives worry/complain about drinking’ and for two patients data on the stages of change were not available.

DISCUSSION

Main findings

We failed to find evidence in medical outpatients for the effectiveness of adding a brief psychological motivational intervention to the physicians’ advice to reduce alcohol consumption. Overall, patients reduced their alcohol intake substantially in the 6 months since their entrance to the clinic. This reduction might, in the first place, be explained as a reactive effect of the screening by the medical specialist and the extensive assessment of the drinking behaviour as part of the inclusion procedure (Bien et al., 1993a; Watson, 1999; Clifford and Maisto, 2000). These activities may have functioned as a trigger for change. Especially, patients who experienced distress about their health and associate this with their excessive alcohol use could have been receptive to this effect. Presenting oneself as a patient, the confrontation with the medical setting and visiting the medical specialist could have created a teachable moment (Longabaugh et al., 2001). Our psychological intervention, which focuses on enhancing motivation by perceiving consequences of excessive use and reflecting on them, does not seem to be able to add much to that. An alternative explanation for the reduction in alcohol intake among all patients is that of a statistical artefact: the tendency to regress to the mean (Anderson and Scott, 1992; Richmond et al., 1995; Poikolainen, 1999).

At least half of the patients received a physician’s advice on problem drinking, which can be seen as a minimal brief intervention. Our study seems to demonstrate that a minimal brief intervention by a physician is as good as a longer brief intervention by a psychologist. These results are in line with those of the large WHO study (Babor and Grant, 1992), which concluded that 5 min of advice were as effective as 20 min of brief counselling.

Our study differs in several aspects from other hospital intervention studies that showed an effect in one or more outcome variables, such as Chick et al. (1985), Heather et al. (1996) and the WHO study (Babor and Grant, 1992). A major difference is that in these studies screening and intervention occurred at the same time. In our study, the screening and intervention procedures were separated in time. This led to higher refusal rates, which may have resulted in the recruitment of patients who tended already to be motivated to change their drinking behaviour. Indeed, 47 of our 123 patients were already in the action stage at baseline. Motivated patients tend to be less in need of a brief motivational intervention and therefore showing its effect will be harder.

Our sample differed from those in most brief intervention studies in the hospital and primary health care setting (Moyer et al., 2002) in that patients entered the study on the basis of MAST type questions (Selzer, 1971) and not on their current consumption level. They did not form a ‘newly identified’ population and no exclusions were made on dependence. Brief psychological interventions might have a lesser impact on such a population.

Nevertheless, we have to question the effectiveness of the DVA for problem drinkers identified in the hospital setting. Our failure to find any effect is in accordance with the results of Forsberg et al. (2000). They found no differences in the amount of drinking after receiving a modified DCU and receiving only a brief assessment followed by feedback of risky alcohol consumption among patients identified as
problem drinkers in an emergency surgical ward. The studies that did find evidence for the effectiveness of the DCU on alcohol consumption were performed among problem drinkers recruited through media advertisements (Miller et al., 1993, 1988) or among patients in a substance abuse treatment setting (Bien et al., 1993b; Brown and Miller, 1993). In all these studies the problem drinkers were self-referred and not screened opportunistically.

Self-referred and opportunistically screened problem drinkers comprised the sample in the primary health care studies, of which most found an effect (Poikolainen, 1999; Ballesteros et al., 2004). In contrast, in our study, only referred patients were included, which may have lead to a selection of patients with more severe conditions and diseases. It is possible that the severity of the conditions and diseases, especially if patients attribute these to alcohol, make hospital patients more receptive to physician’s advice about alcohol consumption or to the reactive effect of the research procedure. Furthermore, in our study a psychologist gave the intervention, whereas in most of the primary care studies it was the general practitioner.

This trial tested the effectiveness of the DVA in real-life conditions, where the active role of the physician was not controlled for. With the exception of presenting the inclusion and exclusion criteria, both the way of screening and the form of usual care were left to the physician. Although preferred from the perspective of implementability, this set-up may have resulted in lesser contrasts than studies with stricter conditions. Most studies that found effects for brief alcohol interventions used special recruitment and screening procedures (Wallace et al., 1988; Anderson and Scott, 1992; Ockene et al., 1999), and compared brief advice with no treatment (Wallace et al., 1988; Anderson and Scott, 1992; Maheswaran et al., 1992). The three trials in primary care that were performed under real-life circumstances showed less obvious beneficial effects for brief interventions (Heather et al., 1987; Richmond et al., 1995; Aalto, 2001). Evidence that brief interventions among problem drinkers can work does not mean they do actually work in practice (Heather, 2002). Although we did not find any main effects, some findings nevertheless are worth mention. We found a larger, although not significant, proportion of patients in the intervention group...
who increased their motivation to change. Receiving the DVA might have influenced the patients’ motivation without materializing into change in drinking behaviour. On the other hand, we also found, in the subgroup of patients drinking above health limits, a larger, although not significantly so, number of control patients who changed their drinking to below health limits. However, being a subgroup of patients, it is possible that randomization had been lost in ways that could be significant.

**Strengths and limitations of the study**

We think the real-life setting in this study is one of its merits. However, one weakness was that the screening was left to the physician. Although a valid screening instrument was used, only 6% of those screened scored as possible problem drinkers, while 11% was to be expected (Persson and Magnusson, 1987; Mathieu et al., 2001). The physicians were especially reluctant to put the screening questions to the heavier drinkers with more severe alcohol-related diseases. Perhaps, for these drinkers, brief interventions could help the most. There were large individual differences between physicians’ recruitment rates because it was hard to motivate some of them to perform the screening. Continuous surveillance and support from the physician supervisor was necessary. The importance of the latter became visible when a supervisor who had enthusiastically initiated and supported the project left the clinic — the number of identified problem drinkers dropped from 11 to 4%. So, there is definite room for improvement in relation to screening for problem drinking by the physician.

Although only two patients in our study were actually receiving treatment for alcohol use, we cannot exclude the possibility that some already had received a brief alcohol intervention from their general practitioner. Because we were looking for an effect of the DVA beyond the effect of physicians’ advice, a study powered to detect small effects should have been used.

By applying a screening questionnaire to measure problem drinking (not consumption), 41 patients (33%) were included who actually drank below health limits. Almost a quarter of these patients had complaints of fatigue and were screened for chronic fatigue syndrome. It is possible that these patients had interpreted the questions about alcohol to be about whether alcohol induced their fatigue and was therefore problematic for them, even though they drank little. Patients drinking below health limits make a ‘floor effect’ likely, i.e. making it more difficult to show an intervention effect. However, the lack of results probably cannot be attributed to this, in that we failed to show an intervention effect even in the subgroup of patients who drank above health limits at baseline.

**Practical implications and future suggestions**

The results of this study do not support the implementation of a structured brief motivational alcohol intervention performed by a psychologist on patients already seen by a physician at referral to a specialist hospital’s outpatient department. However, the implementation of brief interventions including screening by medical specialists should be encouraged.

**REFERENCES**


