



Effectiveness of strategies to implement brief alcohol intervention in primary healthcare

A systematic review

Per Nilsen, Mauri Aalto, Preben Bendtsen & Kaija Seppä

To cite this article: Per Nilsen, Mauri Aalto, Preben Bendtsen & Kaija Seppä (2006) Effectiveness of strategies to implement brief alcohol intervention in primary healthcare, Scandinavian Journal of Primary Health Care, 24:1, 5-15, DOI: [10.1080/02813430500475282](https://doi.org/10.1080/02813430500475282)

To link to this article: <https://doi.org/10.1080/02813430500475282>



Published online: 12 Jul 2009.



Submit your article to this journal [↗](#)



Article views: 5431



View related articles [↗](#)



Citing articles: 13 View citing articles [↗](#)

REVIEW ARTICLE

Effectiveness of strategies to implement brief alcohol intervention in primary healthcare

A systematic review

PER NILSEN¹, MAURI AALTO², PREBEN BENDTSEN¹ & KAIJA SEPPÄ^{3,4}

¹Department of Health and Society, Division of Social Medicine and Public Health Science, Linköping University, Sweden,

²Department of Mental Health and Alcohol Research, National Public Health Institute, Finland, ³Department of General Practice, University of Tampere, Finland, and ⁴Department of Psychiatry, Tampere University Hospital, Finland

Abstract

Objective. To review systematically the available literature on implementation of brief alcohol interventions in primary healthcare in order to determine the effectiveness of the implementation efforts by the health care providers. **Key question.** To what extent have the efforts to implement brief alcohol interventions in primary healthcare environments been successful? **Method.** Literature search from Medline, Cinahl, PsychLIT, Cochrane. **Setting.** Primary healthcare. **Material.** A total of 11 studies encompassing 921 GPs, 266 nurses, 88 medical students, and 44 “non-physicians” from Europe, the USA, and Australia. **Main outcome measures.** Material utilization, screening, and brief intervention rates. **Answer.** Intervention effectiveness (material utilization, screening, and brief intervention rates) generally increased with the intensity of the intervention effort, i.e. the amount of training and/or support provided. Nevertheless, the overall effectiveness was rather modest. However, the studies examined were too heterogeneous, not scientifically rigorous enough, and applied too brief follow-up times to provide conclusive answers.

Key Words: *Brief intervention, implementation, primary health care, screening*

Between 10% and 20% of patients treated in primary healthcare (PHC) drink alcohol at levels considered hazardous [1,2]. Since hazardous drinking is strongly associated with many diseases [3], this figure is considerably higher among certain patient categories [4]. Screening and brief intervention can be conducted in PHC settings to reduce alcohol use among patients. Screening involves asking questions about alcohol use, while brief intervention (BI) is a negotiated conversation between a healthcare provider and patient designed to reduce alcohol use. BI adds an important tool to the PHC providers' repertoire of treatment options as it can be used with minimum disruption to office routine and patient care (see box below).

Key question:

To what extent have efforts to implement brief alcohol interventions in primary healthcare environments been successful?

Answer:

Intervention effectiveness (material utilization, screening, and brief intervention rates) generally increased with the intensity of the intervention effort, i.e. the amount of training and/or support provided. Nevertheless, the overall effectiveness was rather modest. However, the studies examined were too heterogeneous, not scientifically rigorous enough, and applied too brief follow-up times to provide conclusive answers.

Key ingredients of brief alcohol intervention in PHC

- Hazardous drinkers, e.g. patients without alcohol dependence, are the target group.
- BI is also offered for those who do not seek treatment for their drinking.
- BI can be delivered by either a physician or a nurse.
- Counselling typically lasts between 5 and 15 minutes.
- Counselling is **Empathic***, the patient's **Self-efficacy*** is supported and his/her **Responsibility*** for reducing drinking is emphasized.
- The session includes **Feedback*** on assessment of alcohol consumption in comparison with the general population, discussion of possible association between the patient's symptoms and alcohol use, eliciting benefits to reduce drinking and providing options for changing drinking behaviour (**Advice*** and **Menu***).
- The goal is usually moderate drinking rather than abstinence.
- There are often "booster" sessions, which can be part of the normal follow-up consultations for reasons other than alcohol.

*The bold initials of these words make up the acronym FRAMES, describing the key elements of brief intervention [5].

The efficacy of BI is well documented in numerous meta-analyses and systematic reviews [6–16]. In a recent meta-analysis of PHC studies, it was found that treatment of 10 (95% CI 7–17) hazardous drinkers was needed to obtain one success, i.e. reduced alcohol intake to moderate levels [14]. Studies have shown that the positive effect of a BI session is sustained for at least two years [17,18] and that conducting BI is cost-effective [19]. This evidence suggests that BI carried out by PHC providers could be an influential tool with a substantial impact on public health. Research indicates that patients generally have positive views toward discussing alcohol with PHC professionals, which further justifies the use of BI [20–22].

Despite the many factors favouring use of BI, implementation of this tool in PHC practice has often met with problems [23–26]. Research has identified a number of barriers to implementing BI in the routine practice of PHC, including negative attitudes among general practitioners (GPs), who do not believe that this activity is a legitimate part of their work. Insufficient knowledge and skills among PHC providers, lack of time, and inadequate

resources and support have also been identified as important barriers [26]. Implementation research investigates the conditions under which BI is most likely to be implemented in healthcare [27]. A key finding is that multifaceted interventions (e.g. those using several simultaneous strategies) may be more effective than simple ones, because more barriers to change can be addressed [28]. The present study systematically reviews the available literature on the effectiveness of promoting BI implementation by healthcare providers in PHC and evaluates the results in relation to the implementation strategies employed.

Material and methods*Inclusion criteria*

This paper uses as its source a systematic review of the literature to elicit studies that assessed the effectiveness of strategies to implement screening of patients and BI counselling with hazardous drinkers in PHC. Studies were considered for analysis if they met six criteria. The study had to:

- be based on healthcare providers' practices within PHC settings;
- include training components for physicians and/or nurses to implement BI;
- measure the effectiveness of implementation in terms of: (1) material utilization rate (e.g. proportion of PHC providers who screened at least one patient and/or reported use of the materials); (2) screening rate (e.g. number of screened patients per PHC provider and/or proportion of patients who were screened); or (3) BI rate (e.g. number of eligible patients who received BI per PHC provider and/or proportion of eligible patients who received BI). Further aspects may have been examined in the studies but are not analysed in this review;
- measure the effectiveness either before and after or only after the implementation, with or without a control group;
- be pragmatic, which meant that the procedures were integrated into the routine practice of the PHC office in question and that the procedures were administered primarily by the regular on-site PHC providers. Studies that involved staff training but relied on additional on-site personnel for administering the screening of patients were not deemed naturalistic enough to warrant inclusion in this systematic review;
- be published in English, in a peer-reviewed scientific journal.

Data collection

The studies for this review were obtained through literature searches up to March 2005. Searches were made in the databases at Medline, PsychLIT, CINAHL, and the Cochrane Library, using the following terms or relevant combinations thereof: “alcohol”, “brief intervention”, “early intervention”, “secondary prevention”, “implementation”, “primary healthcare”, “general practice”, and “family medicine.”

Abstracts were retrieved and inspected for contents pertaining to naturalistic studies. The full texts of potential studies were then examined carefully and reviewed systematically against the inclusion criteria of this study by all the authors. Eventually, 11 studies [29–39] that satisfied the inclusion criteria were found and were included for analysis in this systematic review.

Review methodology

The analysis of the data gathered was performed as a structured review of each study. Three aspects of the published studies were examined:

- key features, including details of setting, participants, study design, and outcome measures (see Table I);
- implementation strategies (see Table II);
- effectiveness of the implementation strategies (see Table II).

The studies were initially analysed by one of the authors of this study and then discussed with all the authors to reach agreement. The “methods” section of the studies was examined to obtain information on the setting, participants, study design, implementation strategies, and scientific rigour, while the “results” section was studied in order to find information on the effectiveness of the different implementation strategies. The “discussion” section of the studies provided further information regarding the study findings and the conclusions of the authors.

Results

Key features

Table I summarizes key features of the studies. The 11 studies [29–39] were published between 1998 and 2004. One was a multinational collaborative study [38], three were conducted in Australia [29–31], two in England [34,37], two in Sweden [32,35], and one each in Finland [36], Denmark [33], and the USA [39].

Four studies [30,33,34,38] involved one physician per practice, while one study [37] involved one nurse per practice. Six studies [29,31,32,35,36,39] were conducted at the practice level. Two studies [32,36] included all PHC providers. Altogether, 921 GPs, 266 nurses, 88 medical students and 44 “non-physicians” participated in the studies.

Two studies [38,39] assessed the effectiveness of one implementation strategy using a control group strategy, while five studies [30,31,33,34,37] compared the effectiveness of two or three implementation strategies. Two of the studies [32,39] involved comparisons of personnel categories. Three studies [29,35,36] compared neither strategies nor personnel categories.

A randomized controlled trial (RCT) was the most frequently applied study design; it was employed in five studies [30,33,34,37,38] (all with post-test-only outcome measurement). A non-randomized pre-test–post-test design was used in three studies [32,36,39] and a post-test-only design was applied in two studies [29,35]. One study [31] can be characterized as quasi-experimental, in that it compared different implementation strategies but allowed the participants to choose their preferred strategy. A blinded analysis was reported in only one study [38].

The most frequently used outcome measure was BI rate (measured in 10 of the 11 studies) [29–32,34–39], followed by screening rate (9 studies) [30–32,34–39], and material utilization rate (five studies) [29,31,33,34,37]. The primary data sources were questionnaire self-reports and self-monitoring reports of BI activity by the PHC personnel. One study [36] used patients’ self-reports of having been asked and advised about alcohol consumption, while another study [35] used interviews with GPs and nurses to assess the value of the implementation project and activity regarding use of the materials.

Implementation strategies

Table II includes information on the specific implementation strategies. All studies provided the materials needed for BI. All participants, except the groups receiving the BI materials by mail, also received training. The duration of the training ranged from 30 minutes to 2 hours for those studies that included this information. In addition to training and materials, support was offered in seven studies. Only Aalto’s study [36] involved community action and employed a wide communication strategy.

Table I. Key features of the studies.

Study publication; year	Setting; n =number of practices	Participants	Recruitment of participants	Study design; groups compared; use of control group	Outcome measures; measurement points; data sources
Digiusto [29]; 1998	Western Sydney, Australia; n =not reported	34 GPs	Sample pool: 572 GPs in the study area. Survey questionnaire recruitment; 32% of GPs (n =183 GPs) agreed to participate in some form of alcohol and other drug problems training; 19% of these (n =34 GPs) wanted training in intervention for excessive alcohol consumption and were invited to training workshops	Post-test only; no comparisons; no control group	MUR, BIR; 31 weeks (average) after training; GP questionnaire
Gomel [30]; 1998	45-km radius of urban hospital in Sydney, Australia; n =127	127 GPs	Sample pool: 1759 PHC practitioners. From this pool, 628 family physicians were randomly selected and assigned to 3 marketing strategies to promote the uptake of BI materials; 127 physicians who requested the materials agreed to participate in the subsequent training and support project	RCT post-test only; Comparison of 3 strategies; control group	SR, BIR; After completion of study period; GP self-monitoring report
Richmond [31]; 1998	South Eastern Sydney, Australia; n =not reported	96 GPs	Sample pool: GPs in the study area; 64% of GPs (n =96) agreed to participate	Quasi-experimental post-test only; Comparison of 3 strategies; no control group	MUR, SR, BIR; 6 months after training; GP questionnaire and self-monitoring reports
Bendtsen [32]; 1999	Östergötland, Sweden; n =4	19 GPs and 30 nurses	Personnel (“the great majority”) in 4 selected PHC centres from the study area participated	Pre-test–post-test; Comparison of 2 personnel categories; no control group	SR, BIR; prior to and 4 months after study start; GP/nurse questionnaire
Hansen [33]; 1999	26-km radius of Copenhagen hospital, Denmark; n =81	81 GPs	Sample pool: 386 GPs in all 285 practices of the study area. A sample of GPs was selected that included 1 GP per practice for half of the practices. All GPs in single-handed practices were chosen Among the group practices, only 1 GP per practice was chosen; 57% of GPs (n =81) of 143 approached agreed to participate	RCT post-test only; Comparison of 3 strategies; no control group	MUR; 1 month after receipt of the materials; GP questionnaire
Kaner [34]; 1999	Yorkshire, England; n =128	128 GPs	Participating GPs had taken up and agreed to use the BI materials in an earlier study	RCT post-test only; comparison of 2 strategies with control group strategy; control group	MUR, SR, BIR; 3 months after study start; GP self-monitoring report
Andreasson [35]; 2000	Stockholm, Sweden; n =not reported	37 GPs and 44 nurses	Sample pool: 53 GPs and 55 nurses in the study area. Telephone recruitment by a research assistant was used; 70% of GPs (n =37) and 82% of nurses (n =44) agreed to participate	Post-test only; no comparisons; no control group	SR, BIR; 3 months after study start; GP interview
Aalto [36]; 2003	Tampere, Finland; n =2	14 GPs and 10 nurses	All personnel in 2 selected PHC centres	Pre-test–post-test; no comparisons; no control group	SR, BIR; prior to and 3 years after study start; patient questionnaire

Table I (Continued)

Study publication; year	Setting; n =number of practices	Participants	Recruitment of participants	Study design; groups compared; use of control group	Outcome measures; measurement points; data sources
Kaner [37]; 2003	Northern England; n =212	212 nurses	Sample pool: 312 general practices (a practice was eligible for study inclusion if it contained at least 1 nurse who would not be away from practice for more than 2 weeks during the study period). Telephone recruitment by a research assistant was used, employing a scripted conversation to secure nurse agreement to participate; 79% of the nurses (n =212) agreed to participate	RCT post-test only; Comparison of 2 strategies with control group strategy; control group	MUR, SR, BIR; after 3 months; nurse questionnaire
Anderson [38]; 2004	Australia, Belgium, Catalonia, and England; n =340	340 GPs	Sample pool: 2924 GPs in databases of practitioners maintained by national and regional health authorities or by academies and associations of GPs who had requested and agreed to use the BI package in an earlier study. Of 632 GPs who agreed to use the package, 340 GPs participated in this study	RCT post-test only; comparison of 1 strategy with control group strategy; control group	SR, BIR; after 3 months; GP questionnaire
Babor [39]; 2004	West, Southwest, Midwest, and Northeast regions of the USA; n =15	44 physicians, 88 medical students, and 44 non-physicians	10 practices participated, while 5 practices served as controls	Pre-test –post-test; comparison of 1 strategy with control group strategy and comparison of 3 personnel categories; control group	SR, BIR; prior to and 3 months after practice visit; patient questionnaire

Note: Abbreviations: MUR =material utilisation rate; SR =screening rate; BIR =brief intervention rate.

Table II. Description of the implementation strategies and key results.

Study publication; year	BI materials	Strategy 1: Mailed materials (no training)	Strategy 2: Telemarketing (short introduction and materials)	Strategy 3: Materials and training	Strategy 4: Materials, training, and subsequent support
Digiusto [29]; 1998	Not described			Workshop. Duration or content of training not given; n = 34 GPs; MUR – 14% of screening forms used, BIR – 24% of eligible patients = 7.09 eligible patients/GP/week	
Gomel [30]; 1998	AUDIT questionnaire, provider advice handycard, patient booklet	Group 1: n = 34 physicians; SR – 6.34 patients/physician/week, BIR – 9% of eligible patients = 1.64 eligible patients/GP/week		Group 2: Training in the use of the package. Duration not given; n = 45 physicians; SR – 12.87 patients/physician/week, BIR – 13% of eligible patients = 1.72 eligible patients/GP/week	Group 3 = Group 2 plus reminders; n = 40 physicians; SR – 12.68 patients/physician/week, BIR – 13% of eligible patients = 1.64 eligible patients/GP/week; Group 4 = Group 2 plus alternate phone contacts and practice visits every 2 weeks; n = 42 physicians; SR – 16.27 patients/physician/week, BIR – 22% of eligible patients = 2.67 eligible patients/GP/week
Richmond [31]; 1998	Chart for patient education, booklets for patients, self-help manual, summary sheet	Group 1: n = 22 GPs; MUR – 36% users of the materials after 6 months		Group 2: Academic detailing. Duration not given; n = 39 GPs; MUR – 57% users of the materials after 6 months; Group 3: Two-hour training workshop; n = 35 GPs; MUR – 63% users of the materials after 6 months; <i>For all groups:</i> SR – 9.48 patients/GP/week, BIR – 38% of eligible patients = 0.41 eligible patients/GP/week	
Bendtsen [32]; 1999	CAGE questionnaire, consumption questionnaire, provider manual, patient booklet				Outreach training (GPs 30 min and nurses 45 min). A project team of 3 persons then supported personnel during 4–8 weeks and supervised BI done by the PHC's own staff; n = 19 GPs and 30 nurses; SR – 83% of GPs and 25% of nurses reported screening “more often” or “much more often”, BIR – 75% of GPs and 26% of nurses reported giving BI “more often” or “much more often”
Hansen [33]; 1999	AUDIT questionnaire, provider advice handycard, patient booklet	Group 1: n = 47 GPs; MUR – 57% screened at least one patient	Group 2: A researcher phoned the practice, asking the GP if he/she was interested in receiving the BI package. A script was used, containing answers to the most likely questions; n = 50 GPs; MUR – 31% screened at least one patient	Group 3: Academic detailing. Duration not given; n = 46 GPs; MUR – 61% screened at least one patient	

Table II (Continued)

Study publication; year	BI materials	Strategy 1: Mailed materials (no training)	Strategy 2: Telemarketing (short introduction and materials)	Strategy 3: Materials and training	Strategy 4: Materials, training, and subsequent support
Kaner [34]; 1999	AUDIT questionnaire, provider advice handycard, patient booklet	Group 1: n = 43 GPs; MUR – 44% screened at least one patient, SR – 4.19 patients/ GP/week, BIR – 52% of eligible patients were advised = 0.76 eligible patients/GP/week and 27% of eligible patients were given booklet = 0.39 eligible patients/GP/week		Group 2: Face-to-face training at the practice. Duration not given; n = 43 GPs; MUR – 56% screened at least one patient, SR – 7.15 patients/GP/week, BIR – 59% of eligible patients were advised = 1.28 eligible patients/GP/week and 30% of eligible patients were given booklet = 0.65 eligible patients/GP/week	Group 3: Same face-to-face training plus ongoing support and advice via fortnightly phone calls during 12 weeks; n = 42 GPs; MUR – 71% screened at least one patient, SR – 10.2 patients/ GP/week, BIR – 60% of eligible patients were advised = 1.98 eligible patients/GP/week and 29% of eligible patients were given booklet = 0.96 eligible patients/GP/week; <i>For all groups:</i> SR – 7.17 patients/GP/week, BIR – 58% of eligible patients were advised = 1.33 eligible patients/GP/week and 29% of eligible patients were given booklet = 0.66 eligible patients/GP/week
Andreasson [35]; 2000	AUDIT questionnaire, provider manual, patient booklet			Practice visit by project nurse to provide “a brief outline of methods for secondary prevention and a demonstration of materials useful for this purpose”. Mean duration: GPs 30 min and nurses 45 min; n = 37 GPs and 44 nurses; SR – 0.095 patients/GP/week (filled in AUDIT questionnaire) and 0.024 patients/nurse/week (filled in AUDIT questionnaire), BIR – 0.164 patients/GP/ week (given patient booklet) and 0.054 patients/nurse/week (given patient booklet) (number of eligible patients not stated)	
Aalto [36]; 2003	AUDIT questionnaire, provider advice, patient booklet				A model of how to do BI and how to disseminate was developed together with PHC providers through action research. Education based on needs was given and a project nurse and physician were available for consultation in problematic situations. Community action and communication strategy were included to change attitudes. Study duration was 3 years; n = 14 GPs and 10 nurses; SR – baseline 19% = 1.30 patients/GP or nurse/week and follow-up 20% = 1.57 patients/GP or

Table II (Continued)

Study publication; year	BI materials	Strategy 1: Mailed materials (no training)	Strategy 2: Telemarketing (short introduction and materials)	Strategy 3: Materials and training	Strategy 4: Materials, training, and subsequent support
Kaner [37]; 2003	AUDIT questionnaire, provider advice handycard, patient booklet	Group 1: n=76 nurses. MUR – 39% screened at least one patient, SR – 1.66 patients/nurse/week, BIR – 60% of eligible patients = 0.24 eligible patients/nurse/ week		Group 2 Training in how to use the package during an outreach visit. Mean duration: 34 min; n=68 nurses; MUR – 74% screened at least one patient, SR – 2.37 patients/nurse/ week, BIR – 61% of eligible patients =0.41 eligible patients/nurse/week	nurse/week, BIR – baseline 13% of eligible patients =0.14 eligible patients/ GP or nurse/week and follow-up 15% of eligible patients =0.18 eligible patients/ GP or nurse/week Group 3 =Group 2 plus 2 weekly phone calls during 12 weeks; n=68 nurses; MUR – 71% screened at least one patient, SR – 2.56 patients/nurse/week, BIR – 64% of eligible patients =0.45 eligible patients/nurse/week
Anderson [38]; 2004	AUDIT questionnaire, provider advice handycard, patient booklet	Group 1: n=168 GPs. SR – 21% reported “high activity” (screened at least 20% of patients), BIR – 23% reported “high activity” (at least 10% of eligible patients were advised or given booklet)			Group 2: Outreach training (duration not given) and then ongoing support/ advice via alternate phone calls and visits during 12 weeks; n=172 GPs; SR – 39% reported “high activity” (screened at least 20% of patients), BIR – 45% reported “high activity” (at least 10% of eligible patients were advised or given booklet)
Babor [39]; 2004	AUDIT questionnaire, decision-making guide, patient brochures	Group 1: n=unknown number in 5 clinics. SR – 0.14 patients/physician/ week and 0.03 patients/non- physician/week, BIR –0.12 eligible patients/physician/ week and 0.03 eligible patients/non-physician/week were “managed for drinking”			Group 2: Outreach training delivered in less than 3 hours plus technical assistance available via phone or email and through occasional site visits. Study duration not given; n=44 physicians, 88 medical students, 44 non-physicians; SR – 0.56 patients/physician/week and 0.72 patients/non-physician/week, BIR – 0.63 eligible patients/physician/week and 0.36 eligible patients/non-physi- cian/week were “managed for drinking”

Notes: Abbreviations: MUR=material utilization rate; SR=screening rate; BIR=brief intervention rate n=number of PHC personnel. All percentages rounded off. Eligible patients defined differently among the studies.

Effectiveness of the implementation strategies

Table II also contains key results of the studies. In the studies that compared different implementation strategies, BI activity increased with the intensity of implementation effort, although the level of implementation varied considerably among the studies. For example, in the study by Gomel [30], physicians in the “mailed materials” (i.e. no training) group delivered BI to 9% of the eligible patients, while physicians who received training and support in the form of phone contacts or practice visits every two weeks delivered BI to 22% of the eligible patients. In the 1999 study by Kaner [34], the BI rate (proportion of eligible patients who received BI) was 52% for the “mailed materials” group of GPs, 59% for the group who received face-to-face training at the practice, and 60% for the group who received support and advice via fortnightly phone calls in addition to the face-to-face training.

GPs in Bendtsen’s study [32] increased their activity significantly more than the nurses did. The Aalto study [36] did not find any statistically significant differences regarding asking or advising about alcohol between baseline and the three-year follow-up. In Digiusto’s study [29] nearly all GPs indicated that they were already delivering some form of relevant alcohol and drug problem intervention. The Andreasson study [35] concluded that the materials were not used frequently by the GPs, and nurses used the package even less.

Discussion

This systematic review has investigated the effectiveness of different strategies to implement BI in PHC settings. A key finding was that implementation effectiveness (material utilization, screening, and BI rates) generally increased with the intensity of the implementation effort, i.e. the amount of training and/or support provided. Nevertheless, the overall effectiveness was rather modest. Many authors argued that BI requires better adaptation to the realities of PHC to gain more widespread use. However, few of the authors expressed much optimism about successfully implementing BI without substantial training and ongoing support for healthcare providers.

For the studies reviewed here, even when an association between the intensity of implementation effort and effectiveness was seen, this relationship was not always straightforward. For example, the Kaner (2003) study [37] observed a trade-off between the BI rate and the appropriateness of BI delivery, measured as intervening with patients who really were at-risk drinkers and avoiding the delivery

of BI to patients who were not at-risk drinkers. Nurses who received the BI package by mail (the control group) displayed the least errors in overall patient management. The Anderson study [38], which compared how the screening and BI rates were affected by the PHC professionals’ role security and therapeutic commitment, discovered that the rates increased only for those GPs who already felt secure and committed in working with drinkers. When healthcare providers showed low baseline role security and therapeutic commitment, training and support were not associated with increased screening and BI rates.

With the exception of Aalto’s three-year study [36], all the projects included in this review were studied over relatively short time periods. Despite the substantially longer study period, Aalto’s findings were negative, as there was no statistically significant improvement in BI activity after three years. Research in many disciplines has shown that modification of knowledge and attitudes in order to change behaviour is generally a long-term process. Several theories on how the various components leading to behavioural change interact have been presented [40–42]. Knowledge and attitudes have historically been found to have weak correlations. Similarly, attitudes and behaviour have weak to moderate correlations, and are dependent on what types of attitude (e.g. self-efficacy, locus of control, and consciousness) and behaviour (self-reported or observed) are being related [43,44]. Evidence suggests that attitudinal and behavioural change with regard to BI in healthcare must be viewed as a long-term process [45,46]. Addressing BI issues in the basic education of GPs and nurses would probably be beneficial for the PHC providers’ later motivation to conduct BI.

While no simple or quick progression from knowledge increase to BI praxis change can be expected, attitudes may evolve and change depending on how alcohol consumption develops and to what extent other means are used to control or reduce the level of alcohol consumption. Sweden and Finland are currently experiencing drastically increased alcohol use, which has intensified discussions concerning appropriate preventive efforts. Hence, if this development continues, it could possibly speed up BI implementation efforts in Sweden and Finland by fostering more positive overall attitudes towards the use of the BI concept.

In most of the studies reviewed, only those willing to participate were included within the study population. About half of all PHC providers who were asked to participate in these studies were unwilling to do so. If these dropouts had been included in the present analyses, the uptake and utilization rates

would have been even lower than those reported. It is clear from most studies that PHC providers vary greatly in their motivation to conduct BI, which suggests that tailored implementation approaches would be required to influence different subgroups with disparate characteristics. The “diffusion of innovation” concept (developed by Rogers in 1962) describes how individuals adopt ideas, practices, or other “objects” that are perceived as new. Whereas early adopters search for and implement new ideas when they are introduced into their midst, late adopters lag in their acceptance. The characteristics of innovations, as perceived by individuals, help to explain their different rates of adoption. Compatibility of the innovation is a critical aspect, i.e. the degree to which the idea or practice is perceived as being consistent with the existing values, past experiences, and needs of potential adopters [47]. Thus, instead of assuming that all healthcare providers have the same motivation to conduct BI, it would be more useful to segment the PHC providers by adoption receptivity and to tailor BI implementation strategies accordingly.

The studies included in this review had many methodological shortcomings. While the RCT studies were scientifically rigorous, to what extent these studies can be considered naturalistic is questionable. In a natural setting, it is hardly realistic to expect BI to be widely implemented if used by only one GP or nurse per practice, as the design in most of the RCT studies suggested. An “ideal” study would involve PHCs in two (or more) randomly allocated regions, one region functioning as a control group, and blindly assess pre- and post-implementation results, using intention-to-treat analysis. The duration of such a study would have to be extensive, possibly 5 to 10 years, in order to determine whether the changes have become permanent. However, whether such a study would be feasible or even ethical can be questioned, since it would deprive one region of training for 10 years. Hence, we probably have to accept less scientifically rigorous before-and-after studies.

In addition to further BI implementation studies, there is a need for more qualitative research into PHC professionals’ attitudes to working with BI, e.g. their role security in, commitment to, and motivation for BI implementation, as well as factors related to their attitudes to and confidence in the value of BI to reduce drinking (i.e. efficacy of BI). Strategies to implement BI as part of routine PHC practice must be explored with providers of healthcare. Further research is needed into selective screening based on symptoms strongly associated with at-risk drinking, which is a strategy increasingly favoured in the Nordic countries. In many cases, action research

would be a suitable research methodology, as it is a participative and iterative process, which converges towards a better understanding of what happens.

In summary, the studies included in this systematic review were too heterogeneous, generally not scientifically rigorous enough, and applied too short follow-up times to allow for definitive conclusions regarding the effectiveness of different BI implementation strategies. Thus, based on the BI implementation studies conducted hitherto, it is difficult to determine how and under what circumstances BI is most likely to be implemented in PHC settings. Further research is needed to address these critically important issues.

References

- [1] Aalto M, Seppä K, Kiianmaa K, Sillanaukee P. Drinking habits and prevalence of heavy drinking among primary health care outpatients and general population. *Addiction* 1999;94:1371–9.
- [2] Reid MC, Fiellin DA, O’Connor PG. Hazardous and harmful alcohol consumption in primary care. *Arch Intern Med* 1999;159:1681–9.
- [3] Room R, Babor T, Rehm J. Alcohol and public health. *Lancet* 2005;365:519–30.
- [4] Martikainen K, Seppä K, Viita P, Rajala S, Laippala P, Keränen T. Transient loss of consciousness as reason for admission to primary health care emergency room. *Scand J Prim Health Care* 2000;21:61–4.
- [5] Miller WR, Sanchez VC. Motivating young adults for treatment and lifestyle change. In: Howard GS, Nathan PE, editors. *Alcohol use and misuse by young adults*. South Bend, IL: University of Notre Dame Press; 1994. p. 55–81.
- [6] Bien TH, Miller WR, Tonigan JS. Brief interventions for alcohol problems: A review. *Addiction* 1993;88:315–35.
- [7] Kahan M, Wilson L, Becker L. Effectiveness of physician-based interventions with problem drinkers: A review. *CMAJ* 1995;152:851–9.
- [8] Wilk AI, Jensen NM, Havighurst TC. Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers. *J Gen Intern Med* 1997;12:274–83.
- [9] Ashenden R, Silagy C, Weller D. A systematic review of the effectiveness of promoting lifestyle change in general practice. *Fam Pract* 1997;14:160–76.
- [10] Poikolainen K. Effectiveness of brief interventions to reduce alcohol intake in primary health care populations: A meta-analysis. *Prev Med* 1999;28:503–9.
- [11] Moyer A, Finney JW, Swearingen CE, Vergun P. Brief interventions for alcohol problems: A meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction* 2002;97:279–92.
- [12] Salaspuro M. Intervention against hazardous alcohol consumption – secondary prevention of alcohol problems. In: Berglund M, Thelander E, Jonsson E, editors. *Treating alcohol and drug abuse*. Weinheim: Wiley-VCH; 2003. p. 1–41.
- [13] Beich A, Thorsen T, Rollnick S. Screening in brief intervention trials targeting excessive drinkers in general practice: Systematic review and meta-analysis. *BMJ* 2003;327:536–42.
- [14] Ballesteros J, Duffy JC, Querejeta I, Arino J, Gonzalez-Pinto A. Efficacy of brief interventions for hazardous drinkers in

- primary care: Systematic review and meta-analyses. *Alcohol Clin Exp Res* 2004;28:608–18.
- [15] Emmen MJ, Schippers GM, Bleijenberg G, Wollersheim H. Effectiveness of opportunistic brief interventions for problem drinking in a general hospital setting: systematic review. *BMJ* 2004;328:318–20.
 - [16] Whitlock EP, Polen MR, Green CA, Orleans T, Klein J. Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: A summary of the evidence for the US preventive services task force. *Ann Intern Med* 2004;140:557–68.
 - [17] Kristenson H, Ohlin H, Hulten-Nosslin MB, Trell E, Hood B. Identification and intervention of heavy drinking in middle-aged men: results and follow-up of 24–60 months of long-term study with randomized controls. *Alcohol Clin Exp Res* 1983;7:203–9.
 - [18] Persson J, Magnusson PH. Early intervention in patients with excessive consumption of alcohol: A controlled study. *Alcohol Alcohol* 1989;6:403–8.
 - [19] Fleming MF, Mundt MP, French MT, Manwell LB, Stauffacher EA, Barry KL. Brief physician advice for problem drinkers: Long-term efficacy and benefit–cost analysis. *Alcohol Clin Exp Res* 2002;26:36–43.
 - [20] Wallace PG, Haines AP. General practitioner and health promotion: What patients think. *BMJ* 1984;289:534–6.
 - [21] Richmond R, Kehoe L, Heather N, Wodak A, Webster I. General practitioners' promotion of healthy life styles: What patients think. *Aust N Z J Public Health* 1996;20:195–200.
 - [22] Aalto M, Seppä K. Usefulness, length and content of alcohol-related discussions in primary health care: The exit poll survey. *Alcohol Alcohol* 2004;39:532–5.
 - [23] Aalto M, Pekuri P, Seppä K. Primary health care professionals' activity in intervening in patients' alcohol drinking: A patient perspective. *Drug Alcohol Depend* 2002;66:39–43.
 - [24] Beich A, Gannik D, Malterud K. Screening and brief intervention for excessive alcohol use: Qualitative interview study of the experiences of general practitioners. *BMJ* 2002;325:870–2.
 - [25] Johansson K, Bendtsen P, Åkerlind I. Early intervention for problem drinkers: Readiness to participate among general practitioners and nurses in Swedish primary health care. *Alcohol Alcohol* 2002;37:38–42.
 - [26] Roche AM, Freeman T. Brief interventions: Good in theory but weak in practice. *Drug Alcohol Rev* 2004;23:11–8.
 - [27] Babor TF, Higgins-Biddle JC. Alcohol screening and brief intervention: Dissemination strategies for medical practice and public health. *Addiction* 2000;95:677–86.
 - [28] Hulscher MEJL, Wensing M, van der Weijden T, Grol R. Interventions to implement prevention in primary care (Review). *The Cochrane Collaboration*, Wiley; 2005.
 - [29] Digiusto E, Leigh SV, Hardcastle DA, Currie JN. Effectiveness of CME workshops for alcohol and other drug-related interventions in general practice. *Med J Aust* 1998;169:116–7.
 - [30] Gomel M, Wützke SE, Hardcastle DM, Lapsley H, Reznik RB. Cost-effectiveness of strategies to market and train primary health care physicians in brief intervention techniques for hazardous alcohol use. *Soc Sci Med* 1998;47:203–11.
 - [31] Richmond RL, G-Novak K, Kehoe L, Calfas G, Mendelsohn CP, Wodak A. Effect of training on general practitioners' use of a brief intervention for excessive drinkers. *Aust N Z J Public Health* 1998;22:206–9.
 - [32] Bendtsen P, Åkerlind J. Changes in attitudes and practices in primary health care with regard to early intervention for problem drinkers. *Alcohol Alcohol* 1999;34:795–800.
 - [33] Hansen LJ, Olivarius NF, Beich A, Barfod S. Encouraging GPs to undertake screening and brief intervention in order to reduce problem drinking: A randomized controlled trial. *Fam Pract* 1999;16:551–7.
 - [34] Kaner E, Lock C, McAvoy B, Heather N, Gilvarry E. AN RCT of three training and support strategies to encourage implementation of screening and brief alcohol intervention by general practitioners. *Br J Gen Pract* 1999;49:699–703.
 - [35] Andréasson S, Hjalmarsson K, Rehnman C. Implementation and dissemination of methods for prevention of alcohol problems in primary health care: A feasibility study. *Alcohol Alcohol* 2000;35:525–30.
 - [36] Aalto M, Pekuri P, Seppä K. Primary health care professionals' activity in intervening in patients' alcohol drinking during a 3-year brief intervention implementation project. *Drug Alcohol Depend* 2003;69:9–14.
 - [37] Kaner E, Lock C, Heather N, McNamee P, Bond S. Promoting brief alcohol intervention by nurses in primary care: A cluster randomized controlled trial. *Patient Educ Couns* 2003;51:277–84.
 - [38] Anderson P, Kaner E, Wützke S, Funk M, Heather N, Wensing M, Grol R, Pas L. Attitudes and managing alcohol problems in general practice: An interaction analysis based on findings from a WHO collaborative study. *Alcohol Alcohol* 2004;38:597–601.
 - [39] Babor TF, Higgins-Biddle JC, Higgins P, Gassman RA, Gould BE. Training medical providers to conduct alcohol screening and brief interventions. *Subst Abuse* 2004;25:17–26.
 - [40] Ajzen I, Fishbein M. Attitude–behavior relations: A theoretical analysis and review of empirical research. *Psychol Bull* 1977;84:888–918.
 - [41] Wärneryd K-E. Konsumtionens ekonomiska psykologi. Lund: Natur och Kultur 1979 [The economic psychology of consumption] (in Swedish).
 - [42] Ajzen I. Attitudes, personality and behavior. Chicago, IL: Dorsey Press; 1988.
 - [43] Sleet DA, Gielen AC. Developing injury interventions: The role of behavioural science. In: McClure R, Stevenson M, McEvoy S, editors. *The scientific basis of injury prevention and control*. Melbourne: IP Communications; 2004.
 - [44] Lund J, Aarø LE. Presentation of a model placing emphasis on human, structural and cultural factors. *Saf Sci* 2004;42:271–324.
 - [45] van Steenkiste B, van der Weijden T, Stoffers HEJH, Grol R. Barriers to implementing cardiovascular risk tables in routine general practice. *Scand J Prim Health Care* 2004;22:32–7.
 - [46] Anderson P, Gual A, Colom J. Alcohol and primary health care: clinical guidelines on identification and brief interventions. Barcelona: Department of Health of the Government of Catalonia; 2005.
 - [47] Rogers EM. Diffusion of innovations. New York: Free Press; 2003.