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ORIGINAL ARTICLE

Comparison of Systematic Versus Targeted Screening for Detection of Risky Drinking in Primary Care

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Abstract — Aim: To compare two identification methods for risky drinking in primary health care centres (PHCs). **Methods:** Sixteen PHCs from three Swedish counties were randomized into strands: consultation-based early identification (CEI) or systematic screening early identification (SS). Measurements took place at baseline and during two intervention periods. Patients filled in questionnaires including gender, age, if they had the issue of alcohol brought up during the consultation and the AUDIT-C (a three item screening tool). The intervention periods were preceded by training sessions for clinicians. The AUDIT-C was used for categorization of risky drinking with cut-offs for risky drinking set at ≥5 for men and ≥4 for women. In the SS strand, clinicians were supposed to give AUDIT-C to all patients for the identification of risky drinking. In the CEI strands, they were encouraged to use early clinical signs to identify risky drinking. **Results:** The proportions of patients having the issue of alcohol brought up are higher during the intervention periods than baseline. A higher proportion of all patients and of risk drinkers in SS, than in CEI, had the issue of alcohol brought up. A higher mean score of AUDIT-C was found among patients having the issue of alcohol brought up in CEI than in SS, and this was also true after adjusting for age and gender. **Conclusions:** More patients are asked about alcohol in the SS strand and thus have the possibility of receiving brief interventions. CEI identifies risk drinkers with higher AUDIT-C scores which might indicate more severe problems. No comparison of the effectiveness of a brief intervention following these alternative identification procedures is reported here.

BACKGROUND

Alcohol has negative effects on several areas of physical, mental and social health (Rhem *et al.*, 2010). In Sweden, primary health care sees ~70–80% of the population in a 2-year period (Socialstyrelsen, 2002) and many primary health care patients have alcohol-related problems (Pilowsky and Wu, 2012). Results from the annual national public health survey in Sweden for 2007 indicated that 17% of men and 10% of women in the population aged 16–84 years were risk drinkers (Wadman *et al.*, 2009). One study, performed in the northern part of Sweden in 2005, showed that, in a population for one primary health care centre (PHC), 8.8% of the women and 17.3% of the men were risk drinkers. These data included 1.3% of women and 2.3% of men diagnosed with more severe alcohol problems than risky drinking (Västernorrlands, 2005). Thus, PHCs are an important arena for alcohol prevention.

Secondary prevention concerning alcohol involves different methods of early identification of risky drinking and interventions (Salaspuro, 2003). Studies have shown that early identification and brief interventions (EIBI) can have positive effects on alcohol consumption habits (Salaspuro, 2003; Kaner *et al.*, 2007). Although many general practitioners (GPs) and nurses state that alcohol is an important health question, many patients are not asked about their alcohol habits (Aalto *et al.*, 2003; Johansson *et al.*, 2005a). Lack of time, organizational support and faith in their own abilities to help patients change are some of the reasons (Johansson *et al.*, 2005b; Holmqvist *et al.*, 2008) and alcohol is regarded as the most difficult lifestyle topic to discuss with patients (Geirsson *et al.*, 2005; Spak and Andersson, 2008). Some authors claim that systematic screening of all or a majority of patients does not come naturally in consultations with patients in the PHC setting, that it yields too many false-positives and perhaps is not feasible in ordinary practice (Beich *et al.*, 2003). Instead, they suggest the use of a non-systematic early identification method or as we prefer to call it, consultation-based early identification (CEI). This can be performed by asking patients about alcohol when it feels appropriate during the consultation and/or if the patient has specific symptoms (e.g. depression, anxiety or hypertension). Proponents of this method claim that CEI does not disturb the patient/provider contact, which screening questionnaires are reported to do (Beich *et al.*, 2007).

Implementation of new methods must involve more than education to be effective (Rogers, 2003). A systematic review showed that the effectiveness of interventions generally increased (material utilization, screening and brief intervention rates) with the intensity of the intervention efforts, i.e. the use of support strategies and/or amount of training, although the effects were modest (Nilsen *et al.*, 2006). We find that there is a lack of evidence regarding which particular identification method is more likely to be implemented, and hence should result in most patients being asked about alcohol and lead to more interventions for risky drinking.

In order to increase knowledge about the implementation of different methods of identification in order to enhance the EIBI of risk drinkers, we performed a national alcohol prevention study called Secondary Prevention Implementation Research on Alcohol (SPIRA). The effectiveness of BI on patients' drinking behaviours was not studied in this paper.

The aim of this paper was to compare two different identification methods of risk drinkers in primary health care: systematic screening early identification (SS) and CEI. We tested to what extent primary health care patients have the issue of alcohol brought up during consultation with the two different methods and the severity of risky drinking among those having the issue brought up.

METHODS

Data collection

Sixteen PHCs from three Swedish counties (Västra Götaland, Östergötland and Norrbotten) were randomized into different strands. Initially, we used four strands based on two identifications methods, both with and without a coach. In this article, we merged four strands into two based only on identification method; 1) SS including 9 PHCs and 2) CEI including 7 PHCs (Fig. 1). The role of the coach was to enhance implementation but this was not analysed in the present paper. The counties were selected with the purpose of ensuring representation from various parts of Sweden. All PHCs in these counties were invited to participate. Because we did not reach the intended number of PHCs using that method, we also proceeded with snowball sampling using our research networks. The sampled PHCs agreed to be cluster randomized to a fixed treatment condition.

In Sweden, nurses and para-medical staff (psychologists, counsellors and physiotherapists) maintain a comparatively strong and independent position. Thus, because we intended to study effectiveness rather than efficacy, we let the PHCs choose to what extent they wished to use GPs, nurses and other medical staff for the identification of risk drinkers and brief intervention.

The research questionnaires were handed out to all patients at the reception but were filled in at different times in the two different strands, before or after visiting the GP (or other staff carrying out consultations). Patients were excluded if they did not match the age requirements (between 18 and 75 years old) or if they had participated before. Patients were excluded for several reasons (Fig. 2). Heavy workload of the reception staff, substitute staff having no knowledge of the study or refusal/failure by the staff to participate meant that not all eligible patients were asked to participate. Of the people asked to participate, some refused, and not all patients who received the questionnaire completed it or handed it in.

Data were collected at baseline, during 4 weeks of the first intervention period and, finally, 6 months later during 4 weeks of the second intervention period (Fig. 1). Repeated visits were excluded. During the baseline study, which lasted for 2 days, the patients provided information on gender, age, if they had the issue of alcohol brought up during the consultation and a few other questions not analysed in this article. During the first and second intervention periods, each of 4 weeks duration, the patients answered the same questionnaire as well as AUDIT-C, a three item alcohol screening tool (Gual *et al.*, 2002), and the quality of life instrument, EQ-5D (not analysed in this article). The first intervention period was preceded by a staff training session lasting <3 h. During the 6 months interval between the two intervention periods, the staff was expected to continue the systematic screening or CEI, depending on the strand, but the rates of screening and intervention activities were not measured in

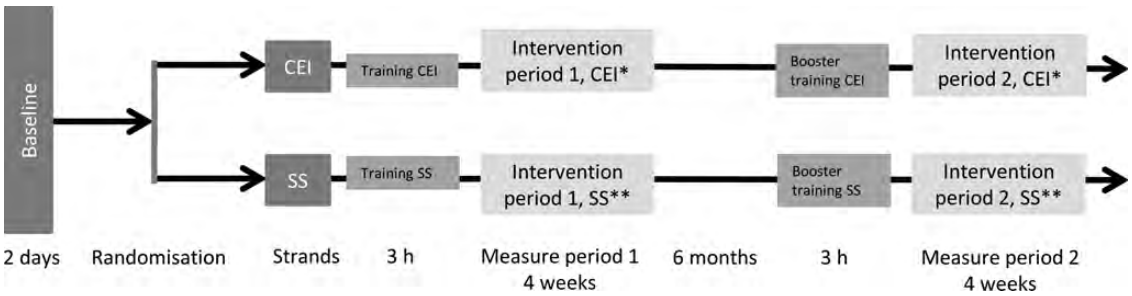

Fig. 1. Flowchart for SPIRA showing progression and measure points. CEI, consultation-based early identification; SS, systematic screening early identification. A single asterisk denotes questionnaires and AUDIT-C filled in after consultation. Double asterisks denote AUDIT-C filled in prior to consultation and questionnaires filled in after consultation.

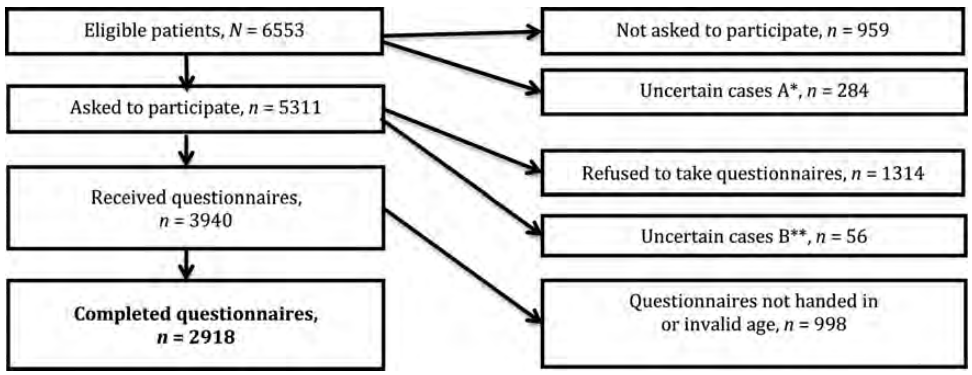

Fig. 2. Flowchart showing the number of patients included and excluded from the patient population during the intervention periods. The flowchart includes intervention periods 1 and 2 only because no data of attrition were collected at baseline. A single asterisk denotes cases where it is unclear whether patients were asked to participate or not. Double asterisks denote cases where it is unclear whether patients refused to take questionnaires or if the questionnaire was not completed by other reasons.

this period. The second intervention period, was preceded by a 3-h booster training session in both strands.

Measurements

AUDIT-C was used to define risky drinking. The AUDIT-C contains the first three questions of AUDIT: (1) how often alcohol is consumed (never, once a month, 2–4 times a month, 2–3 times a week, 4 times a week or more); (2) how many glasses of alcohol are typically consumed during a drinking day (1–2, 3–4, 5–6, 7–9 or at least 10 glasses) and (3) how often a woman drinks at least four and a man at least five glasses per occasion (never, at most once a month, monthly, weekly or daily or almost daily). One glass of alcohol was considered to be ~12 g of ethanol. The total score (0–12 points) from the AUDIT-C questionnaire was calculated by summing the values (0–4 points) for each of the three questions. If the answer to the first question was the first option (never drink alcohol), the remaining questions should be left blank. If there was at least one value missing for any of the questions, the total score was considered as missing. The cut-off points for risky drinking were set at ≥5 points for men and ≥4 points for women.

The questionnaire asked whether the issue of alcohol was brought up during the PHC consultation. Patients could choose from six categories of medical staff that may have asked them and one option if they were not asked. The variable was dichotomized into having the issue brought up or not.

Age was defined as the age at the participants' birthday in 2012 and gender as being male or female.

Strands

SS was performed in 9 PHCs. Patients were handed the questionnaire at the reception area and were asked to return them in a separate mailbox when they left the PHC. They were instructed to fill in the AUDIT-C prior to their consultation. Their responses were then supposed to be considered by the staff during the consultation. The staff was instructed to use ≥5 points for men and ≥4 points for women as the cut-offs for risky drinking. If the AUDIT-C was not filled in before the consultation, the clinician was instructed to ask the patient to complete it during the consultation. After the consultation, patients were instructed to complete the rest of the questionnaire and leave it in a mailbox.

In the CEI strands at 7 PHCs, clinicians were encouraged to give increased attention to alcohol issues, and ask questions about alcohol whenever they found this relevant. We have not found any structured, scientifically tested, CEI method (Reinholdz *et al.*, 2011) but based on the findings of Dawson *et al.* (2008) and our literature review (Reinholdz *et al.*, 2011), we identified eight early signs of risky drinking (depressive and anxiety symptoms, insomnia, interpersonal, work-related and financial problems, hypertension and trauma) and we encouraged the use of these signs by the staff in the CEI strands. The patients were handed the same questionnaire including the AUDIT-C as in the SS strand at the reception but were asked to fill it in after the consultation. Patients could be asked by the clinician to fill in the AUDIT-C during the consultation. The clinician could also ask open questions about alcohol and based on the answers decide if an intervention was needed. After the visit, all patients in this strand were asked to fill in the whole/rest of the questionnaire and leave it in a mailbox on their way out.

Training

Training was offered to all participating staff on alcohol identification. The training demonstrated ways of giving brief interventions including the principles of motivational interviewing and 5A method (Whitlock *et al.*, 2004). The screening strands were taught the principles of the AUDIT-C questionnaire and its interpretation. The CEI strands were taught about which symptoms or conditions to look for to detect risky drinking. For the brief intervention, all strands were taught the 5A method (Whitlock *et al.*, 2004), an US developed model for giving advice to risk drinkers, which was translated into Swedish before the training sessions. After 5 months, we performed a booster training session focussed on the core concepts of 5A and discussions on how the activities had worked out were included.

Analyses

All analyses were performed using SPSS v. 19.0. Chi-square tests were used to obtain *P*-values for differences between groups. Odds ratios with corresponding confidence intervals (CIs) were used in binary logistic regression models. Independent variable *t* tests and CIs (95%) were used for differences between groups in continuous outcome variables. In multiple linear regression models, age and gender were used as covariates, which were also the case for binary logistic regressions. Logically, gender was not used as a covariate when analysing within gender.

At an initial state of this study, we intended to analyse if an additional intervention period affected how often the issue of alcohol was brought up during consultation. However, when comparing the two intervention periods, no significant differences in gender composition ($P = 0.754$), mean age ($P = 0.232$), proportion of risk drinkers ($P = 0.210$), mean value of AUDIT-C ($P = 0.340$) or the proportion of patients having the issue of alcohol brought up ($P = 0.313$) were seen (data not shown for either difference). Thus, to increase the statistical power in the analyses, the two intervention periods were merged and analysed together.

RESULTS

Non-response

Those who were not asked to participate were significantly older and had a higher proportion of men than among those who were asked to participate (Fig. 2). This finding also applies to those who refused to take the questionnaire compared with patients who agreed to participate. The variation in mean age between the various response groups of all the eligible patients, those who were asked to participate, those receiving questionnaires, those completing the questionnaires and those not participating for different reasons was relatively small and ranged from 50.53 to 53.82 (Fig. 2). The proportion of men between the various groups ranged from 28% (uncertain cases B, $n = 56$) to 47.3% (those not asked for participation).

Table 1. Characteristics of patients from intervention periods 1 and 2 completing AUDIT-C during the intervention periods ($n = 3609$)

Strand	Number of patients	Mean age	Alcohol issue raised, % (n)[a]	Risk drinkers, % (n)[b]	Mean AUDIT-C score (CI)[c]
Men, $n = 1414$ (39.2%)					
CEI	573	50.25	33.4 (210)	27.1 (149)	3.29 (3.10–3.47)
SS	556	53.19	57.3 (378)	19.0 (103)	2.97 (2.80–3.14)
Total	1129	51.69	45.7 (588)	23.1 (252)	3.13 (3.00–3.26)
Women, $n = 2195$ (60.8%)					
CEI	889	47.3	24.0 (234)	25.6 (219)	2.59 (2.46–2.72)
SS	890	52.13	50.4 (519)	19.8 (172)	2.20 (2.09–2.32)
Total	1779	49.72	37.6 (753)	22.7 (391)	2.39 (2.31–2.48)

CEI, consultation-based early identification; SS, systematic screening early identification.
[a]Patients reporting having the issue of alcohol brought up by medical staff during consultation.
[b]Proportion of risk drinkers with a cut-off value at ≥5 points for men and ≥4 points for women for AUDIT-C.
[c]95% CIs.

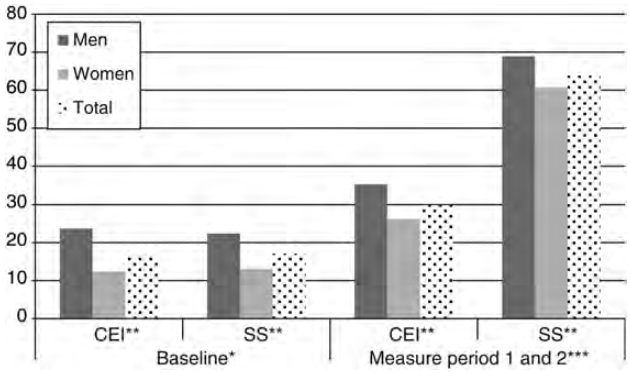

Fig. 3. The proportions of males, females and all patients reporting having the issue of alcohol brought up by PHC staff during consultation. Divided into measurement period (baseline or intervention periods) and strand (CEI, consultation-based early identification and SS, systematic screening early identification). $P < 0.05$ between baseline ($n = 638$) and interventions periods ($n = 2663$). Asterisk denotes the randomization of PHCs into the CEI and SS strands was made after the baseline measurements. $^{**}P < 0.05$ between gender within strand. $^{***}P < 0.05$ between strands.

Demographics

Approximately two-fifths of all patients completing the questionnaire at baseline as well as at the intervention periods were men (Table 1). More patients were included from the intervention periods ($n = 2918$) than at baseline ($n = 704$) because of the longer measurement periods. The number of patients completing the questionnaire in each strand was almost the same. The mean age of men having the issue of alcohol brought up was 54 years and the mean age of risk drinkers was 43.7 years. The corresponding figures for women were 51.6 years and 41.6 years.

Having the issue of alcohol brought up

The proportion of patients who had the issue brought up was higher during the intervention periods than at baseline (<0.03), especially in the SS strand. The difference between the strands was significant in the intervention periods (<0.001), but this was not the case at baseline. Adjusting for age and gender did not change the results (data not shown). Higher proportions of men than women had the issue of alcohol brought up during consultation at baseline and during the intervention periods, in both strands (Fig. 3, $P < 0.03$). The PHCs had not been randomized into the different strands at baseline.

Risk drinkers as defined by AUDIT-C did not differ much from non-risk drinkers in the proportions having the issue of alcohol brought up ($P = 0.082$). No significant difference could be found when analysing genders separately (men = 0.333, women = 0.135). Within each strand, there were also no significant differences between risk- and non-risk drinkers (CEI = 0.913, SS = 0.619; Table 2) in the proportions reporting that the issue of alcohol had been raised.

Having the issue of alcohol brought up among risk drinkers

Looking at risk drinkers only, a higher proportion in the SS strand compared with the CEI strand had the issue brought up. This association was significant for men, for women and for the genders combined (<0.001). It was also stable after adjustments for age and, when applicable, gender (data not shown). A higher proportion of the risk drinkers did not have the issue of alcohol brought up in the CEI strand (70.3%) than in the SS strand (37.5%).

AUDIT-C scores

Men had significantly higher mean scores at AUDIT-C compared with women, as seen in Table 3 ($P < 0.001$). Men identified as risk drinkers (as defined by AUDIT-C) in CEI had significantly higher mean scores than their counterparts in SS, which was also true for women and in total (<0.001). After adjusting for age and when applicable, gender, the significance for men disappeared but remained for the other two categories (Table 4). Risk drinkers identified in the CEI strand had significantly higher mean scores than those identified in the SS strand (0.013). This result was marginally non-significant in the multiple regression models. For patients having the issue of alcohol brought up in the CEI and SS strands, there was also a higher mean for the first strand (0.009) but the difference disappeared after adjustments were made. However, the significance level was reached both before and after adjustments (<0.01) when comparing patients in the earlier and later strands not having the issue of alcohol brought up. Surprisingly, no clear difference could be seen between the patients who had the issue of alcohol brought up and those who did not. This was also true for the risk drinkers as defined by AUDIT-C. The mean score was significantly higher for the risk drinkers who had the issue of alcohol brought up in the CEI strand compared with the

Table 2. The proportions of males, females and all patients reporting having had the issue of alcohol brought up during consultation in PHC ($n = 2585$)

	CEI strand			SS strand		
	Risk drinker	Non-risk drinker	*P*-value between risk and non-risk drinkers	Risk drinker	Non-risk drinker	*P*-value between risk and non-risk drinkers
Men	38.1	34.7	0.466	64.9	69.6	0.372
Women	24.0	27.1	0.386	61.1	60.9	0.952
Total	29.7	30.1	0.913	62.5	64.2	0.619

CEI, consultation-based early identification; SS, systematic screening early identification. $P < 0.001$ between strands in men, women and in total.

Table 3. Mean scores and CIs (95%) for AUDIT-C in males, females and all patients ($n = 2825$)

	CEI strand		SS strand	
	Mean (95% CI)	*n*	Mean (95% CI)	*n*
All patients				
Men	3.29 (3.10–3.47)	550	2.97 (2.80–3.14)	543
Women	2.59 (2.46–2.72)	854	2.20 (2.09–2.32)	869
Alcohol issue raised[a]	2.88 (2.66–3.09)	395	2.56 (2.44–2.69)	817
Alcohol issue not raised[a]	2.88 (2.75–3.01)	920	2.40 (2.22–2.58)	462
Total[b]	2.85 (2.75–2.96)	1411	2.50 (2.40–2.60)	1414
Risk drinkers				
Alcohol issue raised[a]	5.80 (5.52–6.09)	102	5.24 (5.03–5.44)	157
Alcohol issue not raised[a]	5.51 (5.33–5.70)	241	5.39 (5.12–5.66)	94
Total[b]	5.58 (5.44–5.73)	368	5.32 (5.16–5.47)	275
Non-risk drinkers				
Total	1.89 (1.82–1.97)	1036	1.82 (1.74–1.89)	1137

CEI, consultation-based early identification; SS, systematic screening early identification.
[a]Patients reporting having the issue of alcohol brought up, or not, by medical staff during consultation.
[b]The total number of patients does not correspond to the sum of all men and women or all patients asked/not asked about alcohol because of missing values.

Table 4. Simple and multiple linear regression for comparison between the CEI and SS strands for the mean value for AUDIT-C

	Simple regression		Multiple regression	
	Unstandardized β coefficient	*P*-value	Unstandardized β coefficient	*P*-value
All patients				
Men	**–0.317**	**0.014**	–0.175[a]	0.156
Women	**–0.384**	**<0.001**	**–0.208**[a]	**0.015**
Issue of alcohol brought up	**–0.314**	**0.009**	–0.183	0.107
Issue of alcohol not brought up	**–0.481**	**<0.001**	**–0.312**	**0.004**
Total	**–0.355**	**<0.001**	**–0.192**	**0.007**
Risk drinkers				
Issue of alcohol brought up	**–0.568**	**0.001**	**–0.410**	**0.012**
Issue of alcohol not brought up	–0.121	0.479	–0.049	0.750
Total	**–0.268**	**0.015**	–0.190	0.059
Non-risk drinkers				
Total	–0.078	0.149	–0.027	0.602

Significant *P*-values and beta coefficients are in bold type.
[a]Only age was used as a covariate. Elsewhere, age and gender were used in the multiple regression models.
CEI, consultation-based early identification; SS, systematic screening early identification.

SS strand (0.001) and this was also true after adjusting for age and gender (0.012).

DISCUSSION

Demographics

Because there was only a small variation in age between the various response groups (Fig. 2), it can be assumed that the result of alcohol consumption pattern was not biased by the age of the non-responders being much different from the age of the patients completing the questionnaires. The variation in the proportion of men was greater. However, the lowest proportion (28%) was found among the uncertain cases B (Fig. 2); it can be argued that this is less important because the number was so small. However, there were substantial differences in the proportion of men, which, overall, was lower among the study participants than in the attrition group

(data not shown). We believe this means that the AUDIT-C mean value is somewhat underestimated when analysing genders combined because the inclusion of more men would likely have increased the AUDIT-C scores. There might have been some sociodemographic differences between the different strands because the whole PHC was randomized into the strand, and this is a possible explanation for the variation in mean values for AUDIT-C between the strands.

Having the issue of alcohol brought up

One simple explanation for the higher proportion of patients having the issue of alcohol brought up in the SS strand compared with the CEI strand is that more patients were asked to share their AUDIT-C results with the medical staff. Alternatively, the staff was more willing to bring up the issue when AUDIT-C was completed before the consultation.

Even when patients brought prefilled questionnaires to the consultation (as in the SS strand), some patients were still not asked about alcohol. Some of the medical staff probably forgot about, or ignored, using the AUDIT-C as a tool, which limits the success of screening. This may perhaps be due to the fact that the health care of today is only adjusted to fit in the most acute issues and that there may be no time for additional issues.

Having the issue of alcohol brought up among risk drinkers

The proportion of risk drinkers was higher in the CEI strand than in the SS strand and one reason for this might be that AUDIT-C was filled in after the consultation in the CEI strand. This might have produced more valid and honest answers to the AUDIT-C questions because the patients were not face to face with the medical staff after answering the questions. In the CEI strand, a higher proportion (70.3%) of the risk drinkers was missed compared with the SS strand (37.5%). The difference can probably best be explained by the proportion being asked. It seems likely that one possible explanation is that CEI misses risk drinkers because the signs are either difficult to recognize during the consultation or turn up late in the course of developing problems.

AUDIT-C scores

The AUDIT-C scores were higher among risk drinkers who had the issue of alcohol brought up in the CEI strand compared with the SS strand. This might be explained by the fact that the signs that are looked for tend to occur first after a long period of drinking or in patients with more severe alcohol problems. On the other hand, one can argue that CEI is better for identifying risk drinkers because they have more severe problems and this method also produces fewer false-positives. Also, BI might be more effective in those individuals identified by CEI since they already have alcohol-related symptoms, which is in contrast with those identified by systematic screening where most patients could be assumed to lack or only have few symptoms. However, no conclusive evidence for this has yet been reported. This is probably mainly due to the fact that most previous studies have included patients both with and without early alcohol-related symptoms (usually described in the literature as hazardous and harmful drinkers) (Heather, 2011; Kaner *et al.*, 2007).

AUDIT-C cut-off levels

We used cut-offs of ≥5 points for men and ≥4 points for women for the AUDIT-C in this study. One reason for using different cut-offs is that previous studies have used different cut-offs to optimize efficiency. For instance, in a review of AUDIT, the authors argued for a cut-off of ≥4 points for men when identifying hazardous drinking. They added that this requires the number of false-positives to be of little importance. For women, a cut-off of ≥3 points for AUDIT-C was recommended (Reinert and Allen, 2007). An American study evaluated the appropriateness of AUDIT-C as a screening tool for detecting alcohol misuse (defined as having had a diagnosis of an alcohol use disorder or exceeding the recommended American drinking limits during the past year). It was found that a cut-off of ≥4 points for men and ≥2 or ≥3 points for women maximized the sensitivity and specificity (Bradley *et al.*, 2007). A Finnish study of occupational health care patients found the optimal cut-off value of AUDIT-C to be ≥6 points for men and ≥5 points for women, when trying to maximize for sensitivity, specificity and positive predictive value for identifying risk drinkers using AUDIT as gold standard (Kaarne *et al.,* 2010). Another reason for choosing gender-specific cut-offs is the probability of women having alcohol-associated morbidity at lower quantities consumed (Neumann *et al.*, 2004). An issue with choosing gender-specific cut-offs in this study is the proportion of risk drinkers being the same for both genders. According to other studies in Sweden, in which the prevalence of female risk drinkers was around 9% (Västernorrlands, 2005; Wadman *et al.*, 2009), the proportions in our study, ranging from 19.8% in the SS strand to 25.6% in the CEI strand, seem high. The discrepancy between the proportions of male risk drinkers in this study compared with the earlier Swedish studies is smaller; ~17% were risk drinkers in the other studies, compared with 19–27.1% in the SS and CEI strands.

Systematic screening or consultation-based early identification

Beich *et al.* (2003) propose that systematic screening may interfere with the consultation. We are not aware of any solid evidence supporting that screening is not compatible with a good consultation. One can also speculate that if some GPs have problems reconciling screening activities with their consultation style, this problem could be dealt with by training. Even if Beich *et al.* (2003) are right about screening disturbing the consultation we still think that both the patients and society at large would gain more if more risk drinkers were identified, and thus we consider that systematic screening is the best choice. We base this opinion on the higher numbers being identified and the assumption that only in few instances the consultation is disturbed by screening, whereas in many patients, risky drinking is missed if screening is not used. Personally, we think that the possibility of implementing systematic screening is much more likely to succeed today than even just a year ago, since in this study, we have met only little resistance to screening among the staff.

To make recommendations as to which identification method should be used, it would be important to know about the sustainability of the various identification methods. Because both strands were stimulated during the study period (and not after), it is reasonable to suggest that the effect of the

two methods will decline over time. In this context, there are two vital questions; which method will decline least in usage, and which is most likely to be implemented in regular practice. The monetary costs of each method should also be considered. The humanitarian costs, e.g. the harm from intrusion of the patients' privacy and their time, when asking them about alcohol, should further be accounted for.

Limitations

It could be argued that the mere fact that some units were allocated to the systematic screening group should have influenced the results. Although that assumption cannot be ruled out, we do not believe it played a major role. First, the participating PHCs were randomized to either the SS or the CEI strand. Second, the participating units got the same amount of education as well as written support material, and support from the research team was equal in the SS and CEI strands. Further, all patients in both strands received a questionnaire at the reception. The only difference was that in the SS groups the patients were encouraged to present their AUDIT-C scores to the doctor/nurse and in the CEI group the patients filled in the AUDIT-C scores after the visit with the doctor/nurse. In our study the PHCs were paid for research participation and this may also have affected the effort they put into this project, but equally in the two strands. Because we partially used snowballing for recruitment and selection of PHCs and because all PHCs actively chose to participate, the recruited units may have been more willing to work with risky drinking than the average PHC in Sweden. However, some of the PHCs chose to join SPIRA partially because the project enabled them to work with health promotion. But as health promotion is a recent government requirement for all Swedish primary health care centres, we believe our participating units are roughly representative of all PHCs in Sweden. In the recruiting process, we excluded the few parts of the country that in 2008 had a pay-for-performance contract. However, in the last two years such practices have been introduced in most counties. It is not clear if this factor influenced the study outcomes.

In the SPIRA study, we have also measured the competence and willingness of the staff to work with the alcohol issue, and this may have increased their efforts. If having a coach would have increased the efforts of the staff, then the results from SS regarding bringing up the issue of alcohol during consultation may have been overestimated since there were more patients with coach in SS compared to CEI (data not shown).

In Sweden, an administrative reform, 'Free choice of treatment provider', was introduced in 2009 and this delayed our study. Apart from the delay, the only obvious effect of this reform has been an increase of privately operated PHCs, a phenomenon which reflects a general administrative development in Sweden. The increased privatization of the health care sector led to us ending up with a mix of public and private PHCs. All PHCs operate under similar instructions and are publically funded.

CONCLUSIONS

More patients have the issue of alcohol brought up when systematic screening is used when compared with CEI Consequently, more risky drinkers are detected by systematic screening, but as the effectiveness of early alcohol intervention may vary between patients with and without alcohol-related symptoms, we cannot be certain that the higher proportion of risk drinkers identified by systematic screening also leads to more patients benefiting from alcohol intervention, even though we believe that this is the case.

On average, CEI identifies risk drinkers with slightly higher AUDIT-C scores, which might indicate more severe problems. This also implies that CEI identifies risk drinkers at a later stage than when using systematic screening. There is a lack of knowledge on the long-term effect of identification and interventions using the two different identification methods, systematic screening and CEI, and therefore further studies are needed to establish which methods should preferably be implemented in routine care.

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