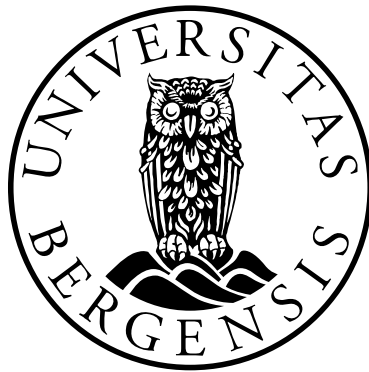


Addressing alcohol in general practice

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Scientific environment

This thesis has been carried out within the institutional framework of the PhD program at the Faculty of Medicine and Dentistry and the Department of Global Public Health and Primary Care, University of Bergen. I have also been affiliated to Centre for Alcohol and Drug Research, Stavanger University Hospital.

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Preface

When I started working on this thesis, I had been a general practitioner (GP) for almost two decades. After my internship in Tingvoll, a small, coastal municipality, I started working full time in the outpatients' emergency room of Stavanger, a big city in Norwegian terms. This made me increasingly curious about the doctor's role, triggered by the considerable difference between being an intern in a small municipality with a high degree of stability and the hectic chaos of the outpatients' emergency room in a big city. The work as an emergency room doctor in the city neither offered the assurance of a pre-defined position towards the patients, nor the opportunity to develop relationships with the patients. I realized that everything that mattered had to happen in the room together with the patient; before and after were out of reach.

An emergency room is a perfect laboratory for developing communication skills as the vast number of patients provides ample opportunity to test different strategies and reflect upon what happens. A few experienced practitioners not far from the city, John Nessa, Eivind Vestbø and Ole Jøssang, inspired and supported my curiosity in those early years. During my professional life I have always been interested in what is going on between patient and doctor and in the doctor's mind. When, after many years of practice, I became interested in alcohol as an important factor in life and health, I was thus especially interested in the patient-doctor interaction and the doctor's views and beliefs. Again I was able to seek support and challenge from others, and Guri Rørtveit, Sverre Nesvåg and Kirsti Malterud were all instrumental in the creation of this project. They have continued to play vital parts in the process; Guri as head of Research Unit for General Practice in Bergen; Sverre as research leader of Centre for Alcohol and Drug Research, Stavanger University Hospital, and Sverre and Kirsti as co-supervisors.

The initial process was quickly leading me to Eivind Meland, who accepted to be my main supervisor. He has supported, challenged and inspired me during these many years. But as none of the above mentioned supervisors excel in statistics, Geir Egil

Eide was brought in, and his patience and skills as a co-supervisor made it possible to complete the third paper. Magne Rekdal, the programmer; Alexander L. Stevenson, the data merger; and Ingvild Dalen, the statistician, were all vital for the completion of the third paper. I will also thank Asgeir Haugedal, whose idea triggered the process which resulted in the third paper.

I am deeply grateful for the support and inspiration from all colleagues in Centre for Alcohol Research, Stavanger University Hospital, in the Research Unit for General Practice/Uni Research, in Department of Global Public Health and Primary Care/University of Bergen, and for the support and understanding from colleagues and staff at Nytorget legesenter. I am also grateful for the support and understanding of all my patients, who have tolerated my absence and accepted all the substitutes they have met in my place. But this project would not have been feasible without the participation of all the doctors. They have, both individually and as group practices, responded to my challenges and given their time and dedication. They have enabled research in an important clinical setting, and hopefully helped bring general practice a small step forward.

Most importantly, I express my gratitude to my family. To my children, now grown-ups, for support and interest and for helping me realize that, at the end of the day, there are more important things in life than doing research; and to my wife Siri, for love and support, challenge and grounding.

List of publications

- I. Lid TG, Malterud K. General practitioners' strategies to identify alcohol problems: A focus group study. *Scand J Prim Health Care*, 2012;30(2):64-9.
- II. Lid TG, Nesvaag S, Meland E: When general practitioners talk about alcohol: exploring facilitating and hampering factors for pragmatic case finding. *Scand J Publ Health*, 2015;43:153-8
- III. Lid TG, Eide GE, Dalen I, Meland E. Can routine information from electronic patient records predict a future diagnosis of alcohol use disorder? (Resubmitted *Scand J Prim Health Care*)

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Abstract

Alcohol use is integrated in many cultural settings, and the positive functions of alcohol as experienced by users are numerous. The Norwegian community has undergone major changes in the past two decades, with an increase in consumption of more than one third. Alcohol is potentially relevant for many medical conditions and health problems. While addiction is a serious problem for those afflicted, many more experience negative health effects from their own or from a significant other's alcohol consumption. Risky or harmful alcohol consumption is frequently not recognized in health care, and efforts to improve recognition of and treatment for alcohol-related health problems have not been very successful. The aim of my PhD is to contribute to increased awareness and understanding among general practitioners regarding the relevance of alcohol in clinical situations, and to contribute to development of better strategies to address alcohol.

The first study was a focus group study where we explored general practitioners' experiences from addressing alcohol. We focused on why they asked about alcohol, how they did it and what happened. We analysed interview data from 13 general practitioners. Sometimes asking was triggered by specific symptoms or health problems, by negative changes in the patient's condition or by a family member expressing concern. In other situations they asked because of routine, as with certain health certificates, a general check-up, meeting a new patient or because of pregnancy. They adapted their asking to their personal style, the patient and the situation. The main finding of this study was that they in many situations addressed alcohol based on clinical relevance, and in certain routine consultations they addressed alcohol as part of that routine. We have coined this *pragmatic case finding*.

In the second study we explored facilitating and hampering factors for the implementation of pragmatic case finding. This focus group study was performed in the context of a four-session seminar in group practices. Fourteen doctors participated in the focus group interviews, and an additional interview with five general practitioners from other surgeries was later performed. We explored both individual

and system factors. An important individual factor was time, perceived as both a challenge and an opportunity. Even though pressed for time, they could also plan for lengthier or more frequent consultations when necessary. The dual nature of alcohol as both normal and a potentially shameful individual problem was a challenge, but focusing on the normal aspects made it easier to talk about alcohol. Addressing alcohol was also easier when they focused on relevance for the patient's health problem. The main system factor regarding implementation of pragmatic case finding was a tension between the mutual commitments in the surgery and the individual doctor's need for autonomy. Younger doctors emphasized the mutual commitments and reported more collective strategies for learning.

The aim of the third study was to explore whether historical data in electronic patient records might aid in earlier recognition of alcohol-related health problems. Nine surgeries with 36 doctors were recruited, and data from 20764 patients on classified non-narcotic medications, new sick leaves, elevated blood tests of gamma-glutamyl transferase or mean corpuscular volume, and potentially alcohol-related diagnoses in ICPC-2 and ICD-10 were collected and analyzed. The observation period was four to 21 years. Adjusted Cox-regressions revealed a significantly increased risk for alcohol use disorder for all variables, with strongest effect for elevated blood tests and weakest for classified non-narcotic medications. The results were not strong enough to enable the development of a clinically useful tool, but they emphasize the relevance of alcohol for many frequent health problems in general practice.

My thesis indicates that an identification strategy based on clinical relevance and targeted screening is feasible in general practice. Pragmatic case finding is a framework enabling improvement by expanding knowledge on the multitude of clinical situations where alcohol may be relevant. Many frequent events in general practice may indicate vulnerability for developing an alcohol related health problem, and thus should prompt the GP to explore whether alcohol might be relevant for the patient's health. Group practices with collective strategies for learning and quality improvement are well suited for improving knowledge and skills in identifying when and how alcohol may be relevant for a patient.

Sammendrag

Alkohol er blitt en naturlig del av mange sosiale sammenhenger, og mange positive effekter tilskrives alkohol. Det norske samfunnet har gjennomgått betydelige forandringer i løpet av de siste par tiår, med en økning i alkoholforbruk på over en tredjedel. Alkohol kan ha betydning for mange medisinske tilstander og helseproblemer. Avhengighet er et alvorlig problem for de berørte, men mange flere opplever negative helseeffekter av egen eller nære pårørendes alkoholforbruk.

Risikofylt eller skadelig alkoholforbruk blir ofte ikke erkjent i helsevesenet, og forsøk på å bedre gjenkjennelsen av og behandlingen for alkoholrelaterte helseproblemer har ikke vært vellykket. Målet med min PhD er å bidra til en økt erkjennelse og forståelse blant allmennleger for alkoholens betydning for mange kliniske problemstillinger, og å bidra til utvikling av bedre strategier for å snakke om alkohol. Den første studien var en fokusgruppestudie hvor vi utforsket allmennlegers erfaringer med å snakke om alkohol. Vi fokuserte på hvorfor de spør om alkohol og hvordan de gjør det, og hva som skjedde da de gjorde det. Vi analyserte intervjudata fra 13 allmennleger. Noen ganger spurte de om alkohol på grunn av bestemte symptomer eller helseproblemer, av negative forandringer i pasientens helse generelt eller på bakgrunn av bekymring fra et familiemedlem. I andre situasjoner spurte de av rutine, uten noen bestemt bekymring, for eksempel ved helseattester, svangerskap eller nye pasienter. Måten de gjorde det på var tilpasset egen stil, pasienten og den aktuelle situasjonen.

Hovedfunnet i denne studien var at de spurte om alkohol i mange situasjoner basert på klinisk relevans, og at de i noen rutinepregete konsultasjoner spurte som del av rutinen. Vi har kalt dette pragmatisk case finding.

I den andre studien utforsket vi faktorer som kunne fremme eller hemme innføring av pragmatisk case finding som metode. Denne fokusgruppestudien ble gjennomført innenfor rammen av et kurs med fire samlinger på legesentrene. Fjorten leger deltok i fokusgruppeintervjuene, og et ekstra intervju med fem allmennleger fra andre legesentre ble gjennomført senere. Vi så etter både individuelle faktorer og systemfaktorer. En sentral individuell faktor var tid, som ble vurdert som både en mulighet og en utfordring. Selv om det var tidspress, kunne legene også planlegge for

lengre eller hyppigere konsultasjoner når det var nødvendig. Alkohol som både normalt og potensielt skambelagt personlig problem var en utfordring, men ved å fokusere på at alkoholforbruk er normalt var det enklere å snakke om det. Å ta opp alkohol som tema var også enklere når de fokuserte på betydningen for pasientens helseproblem. Den mest sentrale systemfaktoren angående implementering av pragmatisk case finding var spenningen mellom gjensidige forpliktelser på legesenteret og den enkelte legens behov for autonomi. Yngre leger la mer vekt på gjensidige forpliktelser og hadde flere kollektive strategier for læring.

Målet med den tredje studien var å utforske om historiske data i elektronisk pasientjournal kunne brukes for å bli tidligere oppmerksom på alkoholrelaterte helseproblemer. Ni legesentre med 36 leger ble rekruttert, og data fra 20764 pasienter angående b-preparater, nye sykemeldinger, forhøyede blodprøver av gammaglutamyl transferase og mean corpuscular volume, og potensielt alkoholrelaterte diagnoser i ICPC-2 og ICD-10 ble samlet inn og analysert. Observasjonstiden var fire til 21 år. Multiple Cox-regresjoner viste en signifikant økt risiko for alkoholbrukslidelse for alle variable, med sterkest effekt for forhøyede blodprøver og svakest for b-preparater. Resultatene var ikke tydelige nok til å fungere som basis for utviklingen av et klinisk nyttig verktøy, men de understreker at alkohol kan være relevant for mange hyppige helseproblemer i allmenpraksis.

Min avhandling indikerer at en identifikasjonsstrategi som bygger på klinisk relevans og målrettet screening er gjennomførbar i allmennpraksis. Pragmatisk case finding er et rammeverk som muliggjør en bedret praksis gjennom å formidle og utvikle kunnskap om de mange kliniske situasjonene hvor alkohol kan være relevant. Mange hyppige hendelser i allmennpraksis kan være tegn på en sårbarhet for å utvikle et alkoholrelatert helseproblem, og bør derfor anspore legen til å utforske om alkohol kan spille en rolle for pasientens helse. Legesentre med felles strategier for læring og kvalitetsutvikling er godt egnet for å utvikle bedre kunnskap og ferdighet i å erkjenne når og hvordan alkohol kan være av betydning for pasienten.

Contents

SCIENTIFIC ENVIRONMENT	I
PREFACE	III
LIST OF PUBLICATIONS	V
ABSTRACT.....	VII
SAMMENDRAG	IX
1. INTRODUCTION – BACKGROUND.....	1
PRECONCEPTIONS.....	1
ALCOHOL AS NORMALITY.....	2
ALCOHOL AND HEALTH.....	5
SCREENING.....	6
IDENTIFICATION OF RISKY OR HARMFUL ALCOHOL CONSUMPTION.....	8
THEORETICAL PERSPECTIVES	10
2. AIM AND RESEARCH QUESTIONS.....	17
3. DESIGN, MATERIAL AND METHODS.....	19
THE PRACTICE EXPERIENCES STUDY (I).....	19
<i>Design, recruitment and data collection</i>	<i>19</i>
<i>Analysis</i>	<i>20</i>
THE IMPLEMENTATION STUDY (II).....	23
<i>Design and recruitment.....</i>	<i>23</i>
<i>Data collection</i>	<i>24</i>
<i>Analysis</i>	<i>25</i>
PATIENT RECORD STUDY (III).....	27
<i>Preparations.....</i>	<i>27</i>
<i>Recruitment</i>	<i>27</i>
<i>Collecting the data</i>	<i>28</i>
<i>Preparing for analysis.....</i>	<i>29</i>
<i>Analysis</i>	<i>30</i>
4. MAIN FINDINGS	33
PAPER I.....	33
PAPER II.....	34
PAPER III.....	35
5. DISCUSSION.....	37
STRENGTHS AND LIMITATIONS	37
<i>Reflexivity.....</i>	<i>37</i>
<i>Internal validity.....</i>	<i>40</i>
<i>External validity</i>	<i>46</i>

<i>Ethical issues</i>	48
DISCUSSION OF FINDINGS.....	50
<i>Is identification of risky or harmful drinking a task for GPs?</i>	50
<i>Addressing alcohol in the consultation – on what basis?</i>	53
<i>Is improvement possible?</i>	57
6. CONCLUSIONS	63
7. IMPLICATIONS FOR CLINICAL PRACTICE	65
8. FUTURE RESEARCH	67
9. REFERENCES	69
APPENDIX A	
<i>ICPC2 and ICD10 codes for outcome diagnoses and for independent variables in study III</i>	
APPENDIX B	
PAPER I.....	
PAPER II	
PAPER III	

1. Introduction – background

Preconceptions

Personal experiences, beliefs, prejudices and conceptions influence all stages of research, from the initial curiosity through planning, execution, analysis and finally presentation of the research (1, 2). Early in my career, when working full time in an outpatients' emergency room, I was struggling to understand the doctor's role and the patient-doctor interaction. This was the starting point for a collaboration with documentary photographer Rune Eraker and Kirsti Malterud, funded by the Norwegian Medical Association (3). Working with this project greatly affected my understanding of what it means to be a doctor.

Later on I have been working with social medicine, community medicine, mental health issues and drug problems besides my general practice. My interest in alcohol came from a growing awareness based on three observations. The first observation was that I, as a general practitioner (GP), rarely saw a classic alcoholic anymore. When I worked in the municipal department of social medicine twenty years ago there were many, but over the years apparently fewer and fewer. Secondly, I became increasingly aware that the major part of substance abuse resources (departments, manpower, guidelines) in the specialized health care system dealt with other drug problems than alcohol. Finally, I had several personal experiences in my own practice where I had not thought about alcohol, but where an alcohol problem later on became evident.

My personal motivation for venturing at this research project was thus multi-faceted. The observation of the 'vanishing alcoholics' triggered my curiosity, because it did not fit with the increase in alcohol consumption. I believed that there was more to it than we were able to see in the primary and secondary health care systems. I was sceptical to the pessimistic conclusions from research on screening and brief interventions (SBI) that GPs, in spite of decades of efforts, still rarely identify and

intervene with problematic alcohol consumption. But I was also painfully aware of the fact that GPs often overlook alcohol as a relevant factor. I hoped to be able to identify events and patterns of events in electronic patient records (EPRs) that could predict future alcohol use disorders. This might then enable us to test whether this knowledge, in the form of a computer-based tool, could assist the doctor in earlier identification of alcohol related health problems.

Ideas, values and practices influence the words people use. Addressing alcohol in clinical practice, it is easy to apply a ‘them and us’ language, focusing on abuse, addiction and diagnoses. I still find it more relevant to see alcohol consumption, alcohol use disorder and addiction as a continuum (4). Many other factors than consumed amounts of alcohol influence to what extent a drinking pattern causes problems for a person and his surroundings, especially the drinking pattern (5). *Abuse* or *misuse* are frequently used terms, with clear negative connotations (6). These terms imply that the patient is to blame, and using such words may have negative effects. International classification of diseases version 10(ICD10) applies *harmful use* or *risky drinking*, which are less value laden terms and more congruent with the notion of continuum and thus probably easier for a patient to understand and identify with (7). *Alcohol use disorder* is a medical term. In this dissertation I use the term for alcohol specific diagnoses as defined in International Classification for Primary Care version 2 (ICPC2) or ICD10, included alcohol specific somatic disorders (7, 8). *Alcohol related health problem* is less specific, but I use the term for health problems or diagnoses that might be caused by alcohol consumption but where other causes are just as plausible. The term *alcohol problem* is not a specific term, but implies some degree of harm or addiction. I will use this term when relevant.

Alcohol as normality

In the past two to three decades Norway has changed from a dry to a wet society with an increase in alcohol litre sold from 4-5 litres yearly to just under 7, in addition to increasing amount of tax-free alcohol (9). There is no reason to believe that the medical community is significantly different from the general population, and doctors

have increased their drinking occasions in the past decades, with about 50 % percent drinking alcohol at least twice weekly (10). People born in the sixties and earlier will remember how smoking at that time was an integral part of both work life and social life, whereas alcohol, especially wine, now has replaced smoking as an integral part of our social life. Alcohol also plays an important role in the grey zones between work and leisure time, and alcohol use is an important ritual affecting integration in or marginalisation from the different work cultures (11).

The Norwegian population still drink less alcohol than in most other countries, but an increase of about 40% in one generation as documented by Rossow, is highly significant. It is also noteworthy that this amount coincidentally equals the amount of wine sold as bag-in-box, slightly larger than half the amount of wine sold (9). The Nord-Trøndelag Health Study demonstrates an increase in reported alcohol consumption for all age cohorts above 20 years of age, with the relatively highest increase in the age cohorts between 50 and 70 years (12). The increase in alcohol consumption among older age groups is a special cause for concern, and a recent report commissioned by the Ministry of Health and Care Services addresses the cultural changes driving these changes and the health effects of increased alcohol consumption in older age groups (over 60 years) (13).

The sociologist Ole Jørgen Skog emphasized the collectivity of drinking cultures (14). He described how people are influenced both by their immediate social network and by society at large, thus individual changes in drinking behaviour tend to be synchronized (14). Skog argues that there is a continuum of consumption patterns, instead of two distinctly different types of drinkers, alcoholics and the others. All consumption levels in a population increase their consumption when the mean consumption increases, with the heavy users less influenced by this increase than the majority. This is a strong argument for addressing the drinking patterns of the majority when average consumption increases, instead of only addressing the heavy users. In my thesis, I therefore focus on the potential relevance of alcohol in everyday clinical situations, instead of focusing on addiction and abuse.

The consumption of alcohol is influenced by cost, and the increase in the public's spending power the past two decades is an important driver in the Norwegian increase in alcohol consumption (9). Societies tend to accept a higher risk associated with alcohol use than for other potentially harmful activities and substances, both when viewed as a voluntary risk (to the drinker) and as an involuntary risk (to others) (15). The authors point out that neither is alcohol subject to international legislation as a psychoactive substance, nor is it treated as other food products. In addition it is also treated ambivalently by public health authorities. Rehm et al explains this situation partly with alcohol's cultural acceptance among elites, the strong influence of global alcohol producers, and a lack of knowledge in the general public. In addition, they question to what extent the public actually accept the risks as reasonable, thus opposing stronger governmental regulations (15).

Alcohol has become an integral part of life for many people in our culture, and has as such probably become increasingly difficult to identify as a potential problem. This is probably due to the significant change in alcohol consumption in Norway, both patterns and amounts, which has a major impact on the society. Changes that people are a part of themselves are difficult to acknowledge. Secondly, if a problem is recognized, it is difficult to address because what is then addressed, may be aspects of people's lives that are highly valued. To many people, a glass of wine is an important part of a good life. Consequently, problematic alcohol consumption is difficult to acknowledge, and difficult to address when acknowledged. The person drinking too much will probably not display any signs typical of alcoholism, hence the GP will not easily recognize it. And in a culture where the majority drinks alcohol, this will be true also for most doctors. Thus addressing a potential alcohol problem might also challenge the doctor's own habits and priorities (16). In my thesis, I therefore decided to explore whether patterns of earlier health incidents might help the doctor in addressing alcohol earlier.

Alcohol and health

In the 19th and 20th century in Western Europe and North America excessive alcohol consumption was a major social problem, seriously affecting families and communities and thus inspiring both the temperance movements and prohibition laws (17, 18). Throughout the 20th century the perspective on excessive alcohol consumption gradually changed to a focus on individual choice, the individual's health and the prevention of non-communicable diseases (19, 20). Alcohol is an important cause of morbidity and mortality, especially in the northern hemisphere (21-24). In Norway, Rossow has documented a 40% increase in alcohol-related hospital admissions, but points to a slight decrease in mortality (9). It is difficult to establish to what extent the increase in alcohol-related hospital admissions is a real increase and to what extent it is caused by raised awareness. The slight decrease in mortality may contradict the increase in admissions, but may also point to earlier diagnosis (because of raised awareness) and better treatment (because of earlier diagnosis and in general improved treatment in the observation period). Rossow also describes a significant increase in experienced violence among teenagers, a point that is also emphasized by other researchers (25).

With increased alcohol consumption, alcohol will also be increasingly important in many different clinical situations (24). But doctors too seldom seem to consider alcohol as a relevant factor in clinical situations, e.g. sleep problems, work related problems, hypertension, anxiety, depression, trauma and family related problems (26, 27). Alcohol has been connected to many diagnoses in all organ systems in ICD10 (24, 28), which illustrates the variety of possible health consequences related to alcohol consumption. Reducing the alcohol consumption and thus the health harms of alcohol is a global priority (29). Alcohol is even more important in older age, as both the number of diagnoses and the number of medications increase with age. In Norway people older than 50 years has increased their alcohol consumption more than other age groups (12). An increased awareness of alcohol in older age groups is therefore needed, both in society at large and in the health care system.

Some health benefits have been linked to moderate alcohol consumption and many studies have indicated a higher mortality among abstainers than moderate drinkers (the J-curve) (30). Several studies have shown a minor protective effect of alcohol against coronary heart disease and cerebral infarction (24, 28, 31). Recently, these conclusions have been challenged. New studies have found that previous definitions of the non-drinking groups have included groups of former drinkers and people abstaining because of health problems (32). Recently genetic factors have been identified as a possible explanation of the potential cardio-protective effect of alcohol (33), indicating a common genetic factor reducing the risk for coronary heart disease as well as the risk for excessive drinking. Knott et al and Holmes et al showed that much of the earlier documented positive effects of alcohol can be attributed to confounding effects and inappropriate selection of comparison group, and in part also be genetically determined. They also found a minor protective effect in women above 65 years, adding that this effect may be caused by selection biases.

Screening

As many diseases and health problems develop slowly and have identifiable risk factors or early stages, it seems logical to develop and implement strategies aimed at earlier diagnosis. The concept *screening* stems from different origins in early 20th century, most notably from the idea of early diagnosis of tuberculosis (x-ray screens) and from public health (screening as protection against e.g. mosquitos or particles in effluent) (20). Later on this metaphorical screen or mesh also took on the meaning of separating out abnormality, especially in children. Thus originally the two main goals of screening are to protect others from harm (identifying early signs of communicable diseases) and to prevent harm later on in an individual (screening of children) (20).

In the last half of the 20th century screening strategies were increasingly focusing early signs of non-communicable diseases. Thereby, the scope of screening was broadened to include risk factors for disease, not only early stages of disease (20, 34). After the second world war criteria for deciding whether a mass-screening strategy was feasible and beneficial was developed by Wilson and Jungner for WHO (35).

These criteria focus on validity and reliability of the test, yield as the measure of previously unrecognized disease diagnosed and brought to treatment, and cost, acceptance and available follow-up services. Essentially, screening is supposed to be simple and feasible in many settings, with low demands on skills and education, but without the specificity of diagnostic tests. A screening measure should thus be cost-effective, the treatment for the disease should be commonly available, and well defined early stages of the disease should be identifiable.

Wilson and Jungner used the term *early disease detection* about strategies to detect risk factors or early stages of disease, be it population based mass screening strategies or case finding in primary health care. Wilson and Jungner furthermore use the term *case finding* similar to *opportunistic screening*, whereas *selective* or *targeted screening* implies the use of some criteria for screening (27, 35). Screening and case finding are clinical strategies aimed at preventing health harm, and may encompass *primary prevention* (reducing susceptibility to disease e.g. by addressing risk factors), *secondary prevention* (reducing health harm by identifying early stages of disease) or *tertiary prevention* (reducing health harm by improved treatment of established disease) (36). Prevention in public health terms are universal, selective or targeted issues (37). *Universal* prevention is aimed at the general public, whereas *selective* prevention is aimed at groups with higher risk, based on age or other characteristics. *Targeted* prevention is aimed at specific individuals with a higher risk, e.g. identified by screening or other measures in general practice.

For a GP, dealing with health worries, illness and disease is a core obligation, and a policy statement from the Norwegian Medical Association emphasizes that managing the health problems and disease has precedence over preventive measures (38). This is reflected in the Norwegian reimbursement system which excludes most preventive measures from reimbursement (39). Even though the cervical screening programme is well integrated in general practice in Norway, and GPs frequently perform case finding (as in measuring blood glucose level and blood pressure without clinical indication), other screening programmes and preventive measures in Norway are mostly organized outside general practice. In my thesis, I therefore wanted to

contribute to the development of preventive better preventive strategies in general practice to reduce alcohol related harm.

Identification of risky or harmful alcohol consumption

Early identification of risky or harmful alcohol consumption is considered an important preventive strategy to reduce health harms from alcohol by WHO (19, 21). Based on epidemiologic studies there is a reasonable international consensus that *risky alcohol consumption* is consumption above certain limits (often 14/9 units (14 for men and 9 for women) per week, or 5/4 units per occasion, one unit being 12 g pure alcohol). But in January 2016 the British health authorities changed their recommendation to maximum 14 units (one unit being 8 g pure alcohol) for both men and women (40). *Harmful alcohol consumption* is a consumption that has already caused health harms or other harms in the patient's life, according to International Classification of Diseases, version 10 (harmful use) (7). In the American Diagnostic and Statistical Manual, version IV (DSM IV), the term *abuse* is applied instead of harmful use (41).

The recommended identification strategy has since the early eighties been universal screening measures, followed by a brief intervention when risky or harmful alcohol consumption is identified (42). The combination of identification and intervention is often referred to as screening and brief intervention (SBI), or screening and brief intervention and referral to treatment (SBIRT) (43, 44). The screening measures are employed to identify the patients eligible for brief interventions, in order to study the effect of these interventions. More rarely the screening was the focus of interest. One essential exception is a systematic review on screening for risky or harmful drinking (45). This review concluded that the number-needed-to-screen was 1000 for two to three patients to reduce their drinking below recommended levels. In other words, for every thousand people screened, less than three change from risky or harmful drinking. Although more patients will gain from a reduction from a high consumption to a lower, but still too high consumption, this review highlights the challenges of universal screening measures in a general health care setting. These challenges are

normally obscured in other reviews focusing on the effect of brief interventions and taking the screening for granted (46, 47). I have therefore in my thesis focused on the identification of risky or harmful drinking in general practice, and not the effect of interventions.

Several validated screening tools have been developed, with the Alcohol Use Disorder Identification Test (AUDIT) as the best validated (48). This test consists of ten questions, and is designed to identify both risky and harmful drinking and alcohol use disorders (primary, secondary and tertiary prevention). A short version, AUDIT C, consists of the first three questions, and identifies risky drinking. CAGE (an acronym of the topics of its four questions, Cut – Annoyed – Guilty – Eye opener) is also a widely used test, but aims primarily at identifying harmful drinking or dependence (49). Single question screening tools have also been tested and validated, with the intent of lowering the threshold for screening (50, 51). In a qualitative study by Beich et al on GPs' experiences with the use of AUDIT as screening tool in a pragmatic controlled trial, the authors found that the GPs experienced the screening measures as time consuming, disturbing their focus and negatively influencing rapport with patients (52, 53). More recently, a survey and a subsequent qualitative study on Norwegian GPs studied the use of and barriers to use of SBI (39, 54). The survey focused specifically on their experiences with screening as such, and on interventions as such. As expected from the Danish studies, screening was not widely used, but the GPs were more familiar with interventions with signs of an alcohol problem. Other strategies for identification of risky or harmful drinking besides screening were not addressed (39). Norwegian Institute for Alcohol and Drug Research (SIRUS) concluded in a report in 2010 that the case for urging GPs to apply SBI probably was lost, and that giving the task over to the nurses might be a better solution (55).

A large body of research has concluded that SBI, or rather the brief intervention part of SBI, is effective, and that it should be implemented in primary health care in general, and amongst GPs especially (56, 57). The Cochrane review from 2009 by Kaner et al asks for more research on women as the documentation is uncertain, but it

concludes that there are no grounds for uncertainty concerning men. Still, in addition to the challenges concerning screening, there is a great heterogeneity in the included studies with many different first line settings besides general practice (56). The fact that more than two decades of efforts to persuade GPs to perform SBI has had at best a minor effect, has for the past years increasingly troubled researchers (58). Saitz points out that there is at best some evidence of efficacy, but no evidence of effectiveness in real world settings. The amount of teaching, supervision and screening efforts in the studies by far exceed available resources in everyday practice. Recently a review of reviews concluded that there is primarily evidence for effect of SBI on middle aged men with risky, but not harmful drinking (46).

Large implementation studies in general practice settings in recent years have also failed to show effect (59-61). These studies applied vast resources to implement and follow up SBI, but Kaner et al conclude that apart from some effect of the screening itself, no added effect of the interventions was found. Van Beurden et al found no effect either, and concluded that even a tailored intervention addressing GP clinics failed to achieve changes in GPs' identification strategies. Butler et al were slightly more optimistic, as they found increased intentions to change and attempts to change, though no behavioural change or improved biochemical measures were documented. All studies screened patients for eligibility for participation, two of the studies applied AUDIT. The third study by Kaner et al also tested targeted screening, but for all studies the screening itself is primarily a prerequisite for testing the interventions, and not the focus of interest. Referring to the evidence regarding SBI and the role of screening strategies, I found that my approach emphasizing addressing alcohol as the basis for further interventions warrants a more thorough examination.

Theoretical perspectives

Below I will briefly present some relevant theoretical perspectives which have influenced the design of the studies and my interpretation of the main findings.

Self-determination theory (SDT) is a psychosocial theory on motivation and learning relevant for both patients' perspectives and GPs' perspectives (62-65). SDT is a holistic psychological theory, focusing on human beings' inherent growth and developmental capacities. According to this theory, people will naturally seek growth, the mastering of new challenges and along the way integrate their experiences into a coherent sense of self, if the basic psychological needs are met, such as self-determination, competence and relatedness. When these basic psychological needs are not sufficiently supported, people will experience ill-being and reduced functioning. SDT stresses the importance of understanding the other's perspective, recognizing his efforts and, when possible, providing different options. Vansteenkiste's article locates SDT in a context relevant for my thesis, as motivational interviewing (MI) is gaining acceptance in general practice as a fruitful strategy for stimulating behaviour change in patients (62, 66). MI is a counselling style facilitating behaviour change and focuses on change processes, and is well suited for brief interventions and compatible with the basic concepts of SDT (67).

Beyond the relevance of SDT for a GP's clinical work with patients, I have also found SDT is relevant for understanding the GP's perspective, emphasizing such a view in this thesis (68). SDT provides a perspective on motivation and learning which focuses on internal motivation, competence, relatedness and self-determination. In a mixed methods study on preventive care delivery in primary care practices the significance of SDT principles for the cognitive psychology of clinician decision making was studied (65). Sussman and colleagues, focusing on preventive counselling on obesity, found that autonomy was a strong factor influencing clinicians' decision on providing preventive care, while competence and relatedness was low, the latter regarding both support from and collaboration with colleagues as well as relatedness to the wider community.

Research on alcohol interventions in general practice has mainly been based on two assumptions. The first assumption is that GPs seldom address problem drinking, and they do not intervene properly if they address it. The second assumption is that by introducing a strategy like SBI, GPs will improve both identification and

intervention. The first assumption has been supported by evidence, while the latter recently has been seriously challenged (45, 46, 52, 54, 59, 61). SDT provides a constructive perspective on why GPs perform badly and so resistant to improvement, and how this may be dealt with. The SDT perspectives have influenced the planning of the projects and the analysis and interpretation of the results in this thesis.

Another influential theoretical perspective, and compatible with SDT, is that of situated learning within communities of practice (69, 70). *Situated learning* is a theory of complex learning, based on anthropological research on apprenticeships. Lave and Wenger argue that learning happens in a social context, where learning is going on all the time, regardless of whether it is focused or not. *Legitimate peripheral participation* is a key concept within the theory of situated learning, describing the process of apprenticeship. The apprentice is initially in the periphery, but with an established position and the expressed goal of acquiring both the skills and the culture of the trade one will eventually be a master of. In a general practice context this process is quite recognizable, though less guidance may be provided in the process.

Situated learning emphasizes the need to focus accidental learning as much as planned learning. The concept of *communities of practice* builds upon situated learning. A community of practice is defined as a group of people sharing a passion or a concern for something they do, and learning how to do it better as they interact regularly (70, 71). A community of practice demonstrates three different characteristics, namely a shared domain of interest, a sense of community, and a practice with a shared repertoire. A GP surgery may be a community of practice continually working together to improve both logistics and clinical practice, thus containing capacity for collective learning about for example alcohol communication. But a GP surgery may also merely be a practical arrangement of office space and sharing some equipment and staff, and thus hardly with any capacity for collective learning.

To be a community of practice, a minimum of interaction and sense of mutual commitment is needed, but much of the interaction may be non-structured. This theoretical framework provides a way of understanding and addressing the tacit and deliberate processes which is going on in a small professional community as a GP clinic. As shown by Sussman et al, such processes may be relevant for the delivery of preventive care, e.g. addressing alcohol (65). Researchers focusing on quality improvement and implementation strategies have applied communities of practice both as a principle for understanding, and as a tool for quality improvement (72-74). This indicates that community of practice is a relevant concept, providing a better understanding of culture and tacit processes in the GP clinic, and how change and quality improvement regarding alcohol identification in this setting may be fostered.

Twenty five years ago Skrabanek and McCormick criticised healthism and the lack of ethical reflection in preventive medicine (75). *Healthism* in their view signify attempts from the authorities to improve the population's health with preventive measures like screening for early signs of disease and campaigns to stimulate healthy behaviour changes. The authors argue that preventive medicine, with screening and case finding, is seen as self-evidently good, and possible harms are neglected. Neither is there, according to Skrabanek and McCormick, any focus on informed consent, which is essential both in clinical research and when performing potentially harmful procedures. Today healthism more frequently signify a preoccupation with a healthy life style, and an individually driven need for medical tests to ensure one's health (76).

The different understandings of healthism point to risk as a pivotal concept, whether perceived by authorities or the individual. *Risk* may be defined as the probability of an adverse event, and though the frequent use of the risk concept in health and medicine has been criticized, it is essential for the understanding of benefit and harm, e.g. from life style factors and interventions (77). Nexøe and colleagues advocate distinguishing theory and empirical data from value judgments and ideology when discussing identification and intervention concerning risk. Whether one addresses the risk factors for disease or criticize the focus on risk factors, the inherent values and

judgments are frequently taken for granted. In a recent paper, Kelly and colleagues discuss the importance of explicitly exploring and integrating values into decision making processes in all levels, e.g. when discussing preventive measures on a population level or in the patient-doctor meeting (78).

On an individual level, risk is something that is experienced by the person, often as something real, even though it is essentially a statistical concept (79). Gillespie explains risk as *measured vulnerability*, emphasizing how statistical measures aimed at managing risk may instead cause uncertainty and anxiety, reifying the vulnerability. Measured vulnerability may be seen as an intersection of the different meanings of healthism, i.e. as a personal experience of vulnerability because of a measured risk factor, when oneself is striving for a healthy life in a culture obsessed with healthy lifestyle (79). The relevance for alcohol consumption of this perspective, using blood cholesterol and prostate specific antigen as examples, is not straight forward. Alcohol consumption is an activity per se, not merely something measured by a doctor. In addition, evidence suggest that risk perception regarding alcohol consumption differs from the perception of other risk factors (15). Still, risk is an essential concept on all levels from the individual to the health authorities when exploring strategies to prevent alcohol related harm.

There are an increasing number of conditions where the GP is expected to screen for risk factors and early signs of disease, and then provide information and advice to prevent future health harms. Less time and effort is consequently available to the patient's present worries and health problems (80). Screening may thus result in a shift of focus from the patient's agenda to the doctor's agenda, without solid evidence of beneficial effects. In 2001 the London GP Fitzpatrick published a book challenging 'the tyranny of health', arguing that health authorities and health care practitioners are gravely mistaken in believing that health concerns are important for people's drinking habits (81). Earlier explorations on patient's views of health promotion in the consultation support this view (82). Strategies to identify unhealthy drinking habits and provide information and advice aimed at changing these habits, are thus potentially missing the point.

There is, however, a vast body of evidence on alcohol documenting its role in numerous diseases and health problems for the user, and as a potentially detrimental factor for other people's health and well-being (19, 22, 23). It may therefore be seen as an ethical obligation to find more suitable ways to address alcohol in general practice. But the lack of undisputable success of SBI so far is a cause for concern. This lack of success has frequently been attributed to a lack of engagement from or skills of GPs, and not as something that seriously questions SBI per se (39, 55, 83). A GP must handle the dilemma between addressing alcohol in the face of uncertainty regarding effect of interventions and the well documented relation between excessive alcohol consumption and many diseases and health problems. Inspired by the perspectives of SDT I have in my thesis explored GPs' own views on when and how alcohol might be addressed. Furthermore, the perspectives of situated learning and communities of practice inspired my interest in the GP surgery, and how this arena might be relevant for developing strategies for improvement of specific aspects of practice, such as addressing patients' use of alcohol.

2. Aim and research questions

The overall aim of this thesis is to contribute to increased awareness and understanding among general practitioners regarding the relevance of alcohol in clinical situations, and to contribute to development of better strategies to address alcohol, especially without a prior invitation from the patient.

The three studies had the following specific aims:

- I. To explore and describe what made the doctors address alcohol without prior invitation from the patient, how did they bring it up, and what happened.
- II. To explore individual and system factors facilitating or hampering the implementation of pragmatic case finding as a strategy for talking about alcohol in general practice.
- III. To explore whether historical data in electronic patient records might aid in earlier recognition of alcohol related health problems.

3. Design, material and methods

We have conducted three empirical studies with different research methods. We initially conducted a focus group study to explore general practitioners' (GP) experiences with initiating talks about alcohol, the *practice experiences* study (I). In the next study, the *implementation* study (II), we explored conditions for implementing findings from the practice experiences study (I) in general practice. In the last study, the *patient record* study (III), we explored whether the electronic patient records (EPR) contain information that might aid in earlier recognition of alcohol related health problems.

The practice experiences study (I)

Design, recruitment and data collection

The practice experiences study was a focus group study, chosen as this is well suited to explore experiences, views and attitudes (84, 85). Initially I posted an invitation letter by e-mail to all registered GPs in the catchment area of Stavanger University Hospital. Subsequently, information was handed out in local seminars and meetings, and e-mails were sent to continuous medical education (CME) groups in the area. To reduce the effects of established group dynamics and to ensure that all participants were prepared to talk about the specific subject, we decided to recruit participants individually, aiming to achieve a purposive sample with maximum variety on age, sex and practice locality.

We conducted two focus group interviews after recruiting 13 participants. The majority held a specialty in family medicine. One group consisted of six experienced participants, of whom three were female, and the other group consisted of seven younger participants, five of them female. We aimed for groups with similar backgrounds, to facilitate openness in the discussions. Our sampling strategy may be described as mixing critical case and typical case sampling (86). No participants had

previously been especially engaged in addiction medicine, but one was a colleague in my own surgery and one was a member of the CME-group I was then tutoring.

Table 1. Participants (N = 13) - background information

Gender	Female	8
	Male	5
Age	30-39	5
	40-49	3
	50-59	4
	>60	1
Practice type	Individual	1
	Group	12
Location	City	11
	Town	2

The interviews dealt with discussion about specific incidents where the participants had asked patients about alcohol or feel they should have asked. Both positive and negative experiences were emphasized as equally important. We asked for situations where they addressed alcohol, factors enabling this and what it led to. In addition we asked for situations where they thought that alcohol might be relevant but where they chose to address the patient's problems in other ways, or where they chose not to intervene.

Analysis

The interviews were recorded digitally on two different recording units, and I transcribed the recordings. Based on a preliminary evaluation of the transcribed interviews we concluded that the data were sufficiently rich to enable a responsible analysis, supported by the narrow aim and sample specificity, and the quality of the dialogue in the groups (87, 88). The material consisted of many specific stories on why alcohol was addressed and how it was done. The analysis was performed jointly by KM and me, using *systematic text condensation* (STC) (89). The process was documented in a decision trail.

1. *Acquiring an overview*

In accordance with STC, the analysis was conducted as a four step process. First we individually read the whole transcript to acquire a total impression, and then we met to discuss preliminary themes and plan further analysis. We agreed on the following overview:

Preliminary themes	Elements
Aha	Routinely (e.g pregnancy, check-up, health certificates) Clinical signs, conditions (mental, somatic) Incidents (accidents, trauma) Hunches Looks Concerned others
Confrontation	Facilitating: The doctor's mandate Concern for children/partners Believing that one has something to offer Alcohol as a cause for many health problems Directly confronting Plant a seed Targeted indirect screening Hampering: Anxious towards authorities/superiors Afraid to violate feelings Risk of rejection Time and space Not sure about what is unhealthy/dangerous
Then what?	Denial, spoilt opportunity Violation Broader perspective on life and worries Leave for later Passing on, referring

2. *Identifying and sorting meaning units*

In this stage we read the transcripts thoroughly and identified meaning units which we then classified in code groups. The different meaning units were thus decontextualized, and the code labels adjusted and changed in an iterative process. The code groups from the preliminary themes were gradually modified:

Why ask or confront	The doctor's hunch Concern by others
----------------------------	---

Strategies for asking or confronting	Using routine strategies Using the health problem Directly confronting
---	--

3. *Condensation*

In stage three we sorted the meaning units within each code group into subgroups. The contents of these subgroups were condensed while applying the participants' own wording as far as possible. These subgroups are not results, but a step in the analytical process. From this condensate an artificial quote encompassing the meaning units in the subgroup was written in first person. Then an authentic quotation was identified to illustrate the main message of the subgroup condensate.

Example: Part of the condensate from the subgroup '*Using the health problem*':

I find it very difficult to ask directly. If the patient has different health problems or symptoms I can reflect together with the patient about many possible causes, alcohol consumption being one of them. If the patient has digestive problems, I may ask if she eats something that increases the problem, or if alcohol may worsen it. From there I can also ask more about the patient's alcohol consumption, both how much and how often. [---]

4. *Synthesizing*

In the last step we re-contextualized the material into an analytic text, summarizing our main findings from each code group based on the condensates from the respective subgroups. The code groups and their headings were adjusted and edited in the analytical process, repeatedly matching changes in our understanding of the text. Our final categories dealt with reasons for asking (acting on clinical signs or routinely asking), what happened when they asked, and reflections on whether it matters at all:

- Acting on a hunch or on a cue
- Routinely taking an opportunity to explore
- Confronting the patient
- Does it really matter at all

Example: ‘Acting on a hunch or on a cue’

Participants described a broad range of situations where the patients’ behaviour made them aware of alcohol issues. The GP’s concern could be prompted by patients’ repeated demands for sick leave, skipping appointments, or not keeping up appearances. Several participants agreed that it was difficult to ask about alcohol consumption if they knew that the patient was having a hard time. One experienced doctor told of how she instead sometimes asked about anxiety or depression. If this was confirmed, continued asking whether the patient was one of those who felt that a glass of wine relieved their problems. “Sliding in sideways”, she called it. Some doctors stated that it was easy to forget alcohol if they just had a vague feeling that something was not right. One experienced GP said, when he responded to a story where depression and an alcohol problem had been overlooked:

“I think that when I just have a feeling that there’s something I can’t grasp, something is missing, then that’s maybe a reason to ask about alcohol”.

(Tony)

The implementation study (II)

Design and recruitment

In this study, we wanted to explore factors potentially affecting implementation of pragmatic case finding in general practice. The empirical data from the implementation study were developed with a focus group design. This study was performed in 2013, and we invited the same GP surgeries as in the patient record study (III), where the data collection had been performed in 2011. These surgeries were originally chosen on grounds of variation in size and stability. The doctors were not taking active part in the patient record study (III) apart from consenting to the data collection, but one participated in the practice experiences study (I).

We planned to embed the focus group interviews in a three-session seminar on pragmatic case finding and dealing with complex drug problems in the surgery. The seminar, which was free of charge and gave 15 CME-credits, constituted the study context, but the intervention itself was not the focus. After an initial failed attempt to recruit, we changed the outlay of the seminar. Inspired by research on situated learning and communities of practice we adapted it to teaching in the surgeries (69, 70). We aimed to recruit all doctors in every surgery, and a new invitation to a four-session seminar and focus group study resulted in four surgeries participating with all their 14 doctors.

Time and location was planned at their convenience, and the sessions were highly interactive, with discussions and role plays. We planned for two focus group interviews with each group, held initially in the first and third sessions (90). Paper II focused on emerging themes regarding individual and system factors relevant for the implementation of pragmatic case finding in this context, and not on evaluation of the seminar as such.

Table 2. Participants - background information

Gender	Female	11
	Male	8
Age	30-39	6
	40-49	4
	50-59	7
	60-69	2
Practice size	< 5 GPs	10
	>= 5 GPs	9
Time in this practice	<=5 ys	8
	>10 ys	11

Data collection

In the first interview we focused on why and how the participating GPs chose to talk about alcohol with patients, to acquire an impression of whether their experiences were in line with our previous findings from the practice experiences study (I). We also explored their reflections on working in a group practice, to understand more

about the impact of situated learning in the practice setting concerning communication about alcohol. In the second interview we focused on conditions for addressing, and conditions for learning and quality improvements in a group practice. This interview enabled a further exploration of facilitating and hampering factors for pragmatic case finding in the context of the surgery as an arena for learning

A preliminary analysis revealed important information on facilitating and hampering factors for pragmatic case finding, and especially the largest surgery reported on collective strategies for learning. As a potentially hampering factor we saw a tendency that they sometimes avoided difficult topics, both with patients and with colleagues. We found this relevant for the implementation of pragmatic case finding, warranting a further exploration. As the largest surgery had a shorter history and younger doctors, we were especially interested in younger doctors' reflections on running a group practice, what they planned for, and what their experiences were when opening a new group practice.

We identified and addressed three group practices with younger doctors, both specialists and non-specialist. Two of the practices were established a couple of years ago and one was just opening. Five doctors accepted the invitation and met for a focus group interview. Data from this interview dealing with preconditions for addressing alcohol and the interface between personal values and collective practices relevant for learning were included in analysis for paper II. The focus group interviews in the seminar were performed by SN, while TGL performed the additional focus group interview.

Analysis

The interviews were recorded digitally on two different audio recorders, and the transcripts were prepared by a secretary and checked by me. The analysis was jointly performed by SN, EM and myself, guided by systematic text condensation (see the practice experiences study (I) for a more thorough description of the method) (89). We applied editing analysis style, with perspectives on screening and healthism as backdrop and inspiration together with perspectives on situated learning and

communities of practice (20, 69, 70, 86, 91). We focused on dilemmas and resistance in the material in order to achieve a better understanding of conflict and tension on addressing alcohol with their patients, and how they collaborated with their colleagues when implementing pragmatic case finding. We looked especially for system factors from the practices perceived by the participants to have an impact on learning about addressing alcohol and other vulnerable issues. The analytic process was documented in a decision trail.

In the first step, we acquired an overview of the transcripts from all the focus group interviews. The preliminary themes we agreed on were ‘Talks about alcohol talks’ and ‘Talks about collaboration’.

Preliminary themes	Elements
Talks about alcohol talks	Relevance of pragmatic case finding Time as opportunity Barriers in the doctor’s mind Caring for the whole patient
Talks about collaboration	Framework – need for structure Creating a common identity Learning together Dealing with potential conflict and vulnerable topics A small business Stability and community

In the second step we read the transcripts thoroughly, identified meaning units and sorted the meaning units into code groups. We also looked for meaning units which either supported or contradicted the code, and looked for connections between the clinical work and the collaboration on difficult or vulnerable matters. We agreed on the following code groups:

	Code groups
Individual factors	Present an opportunity for change, when relevant Time as constraint and opportunity Between normality and shame
System factors	Autonomy and mutual commitment Creating and expressing a common identity

In the third step we grouped the meaning units in subgroups which were then condensed. In the fourth step we re-contextualized the material, adjusted the code groups and headings and concluded on the following four main categories of findings:

- *Negotiating shared responsibility and autonomy*
- *Between normality and shame*
- *The constraints and possibilities of time*
- *Presenting an opportunity for change, when relevant*

Patient record study (III)

Preparations

This was a register study based on historical data from EPRs, partly inspired by a study on longitudinal data as predictors of a future diagnose of domestic abuse (92). The ambition was initially to develop a foundation for a new version of the software called Argus (now discontinued), which originally identified patterns of data in the electronic patient records (EPRs) indicating an increased risk of coronary heart disease. We aimed to explore whether information or patterns of information registered in the EPR might aid in earlier recognition of alcohol related health problems which might predict a future diagnosis of alcohol use disorder, and if this could be applied in Argus for clinical cues.

Recruitment

We recruited nine GP surgeries with one to seven doctors each (median 3.5) and a total of 36 registered doctors and the data were collected in 2011. Three of the participants from the practice experiences study (I) worked at surgeries included in the patient record study (III). The surgeries, all situated in the catchment area of Stavanger University Hospital, were chosen for maximum variety in size, turnover, and location (urban, suburban, rural). According to available data from the end of 2013 ten percent of doctors in Norway worked in a solo practice, with mean number

of doctors per practice 3 and median number 7.5 (93). The majority of practices are thus small, and though these data are not very robust, we judged our sample to be sufficiently representative for GP surgeries in Norway.

Collecting the data

The participants were in general not actively involved in any stage of this study, but one GP in every surgery had to provide access to enable the data collection. The first data collection was performed manually by Magne Rekdal, who spent one day in the pilot surgery. Then an automatized version was made based on the manual version, and tested by me in another surgery. This automatized version required a few adjustments, prior to collecting data in all surgeries. The automatized data collection process, lasting about 10 minutes in each surgery, was performed around closing time.

We collected data on the variables gender, birth year, registered doctor, and surgery. All patients received a unique 8 digit code with numbers and letters. This code was changed with every new running of the program, thus a repeated data collection in the same surgery would produce different codes. The process cannot be reversed to identify a patient. All patients with at least four years of follow-up time after age 18, and with an active patient record until the time of data gathering, were included. The Norwegian list patient system ensures that a patient may only be registered with one doctor at the time. Patients without a registered doctor on the time of data gathering were excluded. The patients were thus alive and registered with one of the 36 doctors at least until the month prior to data gathering.

All data, except the few incidents where incoming texts were saved as images, were scanned by the program. Incoming reports were in the early half of the period mainly typewritten and saved as texts, and in the late half mainly received electronically. In between these two periods, reports were scanned and saved as images or as text files. Start of the patient record was defined as the first entry with a corresponding diagnosis in International Classification for Primary Care 2 (ICPC2) after turning 18.

Censoring was defined as the first of the month prior to data gathering, or at the time for the last text with a corresponding ICPC2 diagnosis if this was more recent.

We collected data from 30537 individual patients on number of prescriptions of codeine, tramadol, ethylmorphine and benzodiazepines, including the so-called non-benzodiazepines (in Norway Class B) (94). Other independent variables were number of elevated tests for mean cell volume (MCV) and gamma-glutamyl transferase (GGT) (95-97). We also gathered numbers of new sick leaves, defined as a sick leave after at least 16 days without any sick leave (98, 99). This definition is based on the Norwegian 16-days employer-paid part of a sick leave.

As predictors we included diagnostic codes from the diagnosis module of the EPR and from text notes and discharge reports. In Norway ICPC2 is applied in general practice, but hospitals and specialist outpatient clinics apply ICD10 (7, 8). We used ICPC2 and ICD10 codes with known alcohol fractions (attributable risk) (24, 28, 100). We included mental, psychosocial and somatic ICPC2-diagnoses where earlier research indicates a possible relation to alcohol (27, 101). Appendix A presents a complete list of the ICPC2 and ICD10 codes for outcome diagnoses and for independent variables. We included compound words with ‘alcohol’ from the running text, aiming to identify situations where an alcohol problem was identified and dealt with without applying a diagnostic code.

Preparing for analysis

The data collection produced eight different data files from each surgery, and the files were stepwise merged to a complete dataset. The unique code for each patient was replaced with a consecutive number, starting with 1. Sick listings were a major challenge, partly because each contains two dates often not corresponding to the date of issue. Some patients had two jobs requiring two sick listings. Older data (before 2000) on sick listings were frequently flawed, e.g. with switched dates (inverted time period) or extremely long sick listings. In addition partial sick listings were frequently flawed. We managed to correct many of the flaws, and we opted for excluding partial sick listings for pragmatic reasons. We excluded all continuations of

sick leaves as well as sick leaves exceeding 28 days or starting less than 16 days after the last sick leave as we aimed to focus on the event of getting a sick listing.

We created one variable for alcohol-related ICPC2-diagnoses and one for alcohol-related ICD10-diagnoses with an alcohol-related fraction over 0.3 (24). The ICPC2-diagnoses consisted of translations from the ICD10-diagnoses and diagnoses from a systematic review (27). Start of follow-up ($t = 0$) was set after an observation period of four years. For patients with an EPR starting prior to the age of 18, start of observation period was set to January 1st the year they turned 18. Alcohol use disorder (AUD) was defined for ICD10, included alcohol specific somatic disorders (24, 28). AUD for ICPC2-diagnoses was defined by converting ICD10-diagnoses to ICPC2, and to retain the specificity of ICD10 we applied these ICPC2-diagnoses only if 'alcohol' was included in the diagnosis' text field.

I identified the word alcohol and all versions of compound words with 'alcohol' in the dataset, and manually identified versions highly indicative of an alcohol problem. These were then defined as AUD text fragments, and the validity of this definition was later tested by extracting a new dataset from one of the surgeries, with a 12 word text fragment with 'alcohol' in the middle. Comprehensive AUD (c-AUD) was defined as our main outcome, and constituted either an AUD (in ICC2 or ICD10), or an AUD text fragment. Patients with an AUD or an AUD text fragment during the observation period before start of follow-up were excluded. Patients with $t = 0$ later than 79 years, and all data after 79 years, were excluded. The major part of preparing for analysis was done in SPSS19.

Analysis

Based on the inclusion criteria analysis was done using Stata13 for 20764 patients, with the file in long format with one line for each event date. We applied mean, median, standard deviation, range and per cent for the descriptive statistics. Correlations were estimated with Spearman's rho. Cox proportional hazards model using the `stcox` command was applied to analyse time from $t = 0$ until alcohol specific outcome (c-AUD). The following time-dependent predictors were updated for each

event date: class B prescriptions, new sick leaves, elevated laboratory test and alcohol-related diagnoses (ICPC2 and ICD10). We ran a univariate and a multivariate model, the latter intended for backwards stepwise selection, until only variables significant at the 5% significance level were retained (102, 103). All variables were analysed per 10 events. The dependency between events within the same patient is accounted for in Cox proportional hazards model including time-dependent covariates without the `vce(robust)` option (104). We performed Cox-regressions for the complete dataset and compared with a dataset where predictor events more than four years prior to the current date were deleted from the cumulative variables. We found higher HRs when older predictor events were excluded from the cumulative variables, and we judged that this was a more clinically relevant strategy.

A prognostic index was defined from the Cox-regression and evaluated against the patient's c-AUD status four years after each update of the index. This was done by calculating sensitivity and specificity and plotting the corresponding receiver operating characteristics (ROC) curve for all predictor events with a history of at least four years after the predictor event (105, 106). Predictor events more than four years prior to the current date were deleted from the cumulative variables.

4. Main findings

Paper I

Lid TG, Malterud K. General practitioners' strategies to identify alcohol problems: A focus group study. *Scand J Prim Health Care*, 2012; 30: 64-69

The first study was a focus group study on GPs' experiences on initiating talks about alcohol; why they decided to ask, how they chose to do it, and what happened then. We interviewed 14 GPs in two groups, and the interviews were recorded and transcribed, and analysed according to systematic text condensation.

The participants' stories dealt with mainly two different reasons for GPs to ask about alcohol without prior invitation. Firstly and most frequently asking about alcohol was triggered by a change or something happening with the patient, or with concern expressed by a next of kin. Things happening to a patient could be an accident or an acute admission to hospital or a health complaint like diarrhoea or a finding like hypertension. Sometimes the cue was a patient's frequent need for sick leaves, or the doctor had a hunch that something was not right. Secondly, they also sometimes asked routinely about alcohol, e.g. with regular check-ups or health certificates, or the first encounter with a new patient. When asking about alcohol they applied different strategies, varying with their own style and their perception of the patient and the situation. Some doctors reported having a more blunt way of asking, others reported being more careful. Sometimes the situation called for a more confrontational style. The discrepancy between official recommendations from health authorities and the amounts people drank, made it difficult to establish common ground for the discussion. Asking again later when a patient had denied any drinking problem was difficult, but they also experienced patients making important changes after being asked about alcohol in connection with a health problem.

GPs inquire about alcohol in ways adapted to the specific patient and the clinical situation. The combination of primarily asking based on signs and findings and asking routinely in other situations, we have coined *pragmatic case finding*.

Paper II

Lid TG, Nesvaag S, Meland E. When general practitioners talk about alcohol: exploring facilitating and hampering factors for pragmatic case finding. *Scand J Publ Health*, 2015; 43: 153-8

In this study we explored facilitating and hampering factors relevant for the implementation of pragmatic case finding in general practice. The study setting was a four session interactive seminar on earlier identification of alcohol related health problems, and on dealing with complex drug problems in a group practice. 14 GPs from four surgeries were interviewed twice in two groups. After preliminary analysis an additional focus group interview with five GPs from two other surgeries was held. Interviews were recorded, transcribed and analyzed guided by systematic text condensation.

We grouped the findings in system factors dealing with the group practice, and individual factors dealing with the patient-doctor interaction. The main system factor was a tension between the mutual commitments in the surgery and the individual doctor's need for autonomy. Doctors in the recently established practices emphasized the mutual commitments and reported more collective strategies for learning and establishing a common practice. The main individual factors were firstly time, which was perceived as both a constraint and an opportunity. Though busy, they focused on the significance of new chances and the possibility to plan for a lengthier consultation next time. Secondly, the dual nature of alcohol as both an integral part of normality and a shameful individual problem was a challenge, as focusing on the normality facilitated addressing alcohol, but when a more obvious problem, it was more difficult to ask because of shame. Finally, they presented many stories on alcohol's relevance for patient's health problem, but a few challenged the lack of structure in pragmatic case finding.

This study supports pragmatic case finding as relevant and feasible for addressing alcohol in general practice, and indicates that implementation strategies should address the surgeries' own strategies for learning and quality improvement.

Paper III

Lid TG, Eide GEE, Dalen I, Meland E. Predictors of future alcohol-related health problems: a retrospective longitudinal study from general practice. Resubmitted, Scand J Prim Health Care.

We wanted to explore whether historical data in electronic patient records might aid in earlier recognition of alcohol-related health problems. Nine surgeries with 36 doctors were recruited, and data from 20764 patients on the variables classified non-narcotic medications, new sick leaves, elevated blood tests of gamma-glutamyl transferase or mean corpuscular volume, and potentially alcohol-related diagnoses in ICPC-2 and ICD-10 was collected. The observation period was four to 21 years. End point was comprehensive alcohol use disorder (c-AUD), defined as either an alcohol use disorder (AUD) in ICPC-2 or ICD-10, or a text fragment documenting that an alcohol problem had been addressed (AUD text fragment).

We found that male patients had a doubled risk of c-AUD, and when we splitted up there was 67.9% of those with AUD where male as opposed to 41.1% male with AUD text fragment, indicating a higher threshold for applying a specific diagnosis for female patients. Adjusted Cox-regressions revealed a significantly increased risk of c-AUD for all variables, which were analyzed per 10 events. Elevated blood tests gave an HR of 3.50, and HRs for the other variables were between 1.25 and 2.00, with $p < 0.05$. Maximum number of events was 774 for classified non-narcotic medications, 143 for new sick leaves, and lower for the other variables. The ROC-curve gave area-under-the-curve of 0.72, showing that when including all variables the sensitivity of c-AUD is only 0.5, when the specificity slightly exceeds 0.75. Still, many patients will experience several of these incidents over the years, and repeated incidents may indicate increased vulnerability for developing an alcohol problem, or be early signs of an alcohol problem.

Electronic patient records consist of rich data that may indicate an increased risk or vulnerability for alcohol use disorders. The results were not strong enough to enable the development of a clinically useful tool.

5. Discussion

Strengths and limitations

In the practice experiences study (I) we have explored GPs' stories about why and how they address alcohol in their practice. In the implementation study (II) we explored individual factors and system factors that might facilitate or hamper the implementation of our findings. In the final study, the patient record study (III), we gathered retrospective longitudinal data from individual EPRs to explore whether historical data might aid in earlier recognition of alcohol related health problems. I will discuss the studies' strengths and limitations emphasizing reflexivity and validity. Finally I will discuss interpretations and implications of our findings.

Reflexivity

The researcher is always a part of the research, influencing both the process and the result, independent of method. My experiences and preconceptions and my role in the local medical community have influenced my research. My choice of alcohol as topic and the strategies I chose to explore it are also affected by personal beliefs, attitudes and practices. It is well documented that doctor's own drinking habits and experiences influence how and when they choose to address alcohol (16). Though I am aware of this, my experiences and drinking habits still affect my research, as all research activity is situated, positioned somewhere, in a context (107). Growing up in the south west of Norway in the 1960s and 1970s, a culture strongly influenced by religious lay movements and the temperance movement, has probably heightened my awareness of alcohol as more important than other drugs. My background as a GP has been a basis for my curiosity, and a position from where I have judged the body of research, as well as our own strategies and findings. An awareness of this situatedness of knowledge and perspectives is essential for the ability to appreciate and take into account other perspectives than one's own. Still, I have so far chosen not to include the perspectives of other actors in my research, e.g. patients' perspectives, though they are equally important.

Practising as a GP for most of my research period has been challenging, but it has enabled me to keep in perspective the needs of a help-seeking patient and a doctor providing help. Furthermore I realized that the critical distance I have developed towards the pharmaceutical industries' strategies to influence physicians' medical decisions, especially the lowering of treatment thresholds, was helpful in developing an awareness of influences by health authorities in preventive medicine (108). Many well intended attempts by health authorities to increase physicians' efforts to reduce negative life style factors use a similar logic as the pharmaceutical industry, exemplified by 'prehypertension' (109, 110). By lowering the thresholds for identification and intervention, the identified problem will be perceived as more essential, and suitable interventions will be in higher demand. I am aware that this is a valid criticism of our findings, too. This awareness has strengthened my interest in finding other, hopefully more relevant, strategies for addressing alcohol.

After more than 20 years of clinical practice and in other professional roles in my home city, a majority of the local doctors will have some kind of knowledge of or relation to me. This has first of all greatly enabled my research and helped me acquire rich data. I have tried to minimize potentially detrimental effects, e.g. of participants feeling a special obligation to help me, by deliberately aiming to recruit participants without a close relationship to me. In the practice experiences study (I) all degrees of relations to me were present in the group, from having met once (two participants) to being colleagues in the same surgery (one participant). The transcripts from the implementation study (II) reveal that one doctor stated that the awareness of the data collection for the patient record study (III) two years earlier made her address alcohol more frequently for some time. Another participant from a small surgery stated that they participated partly because they wanted to help me in my research. These are examples of how my role has influenced both the clinical practice we are exploring and motives for participating. I will add that the influence of my role on the participation in the implementation study has probably not been very strong, as only three doctors volunteered in the first recruitment attempt.

As an integral part of my role in the local medical community, I have applied findings from the practice experiences study (I) together with other relevant knowledge in local CME-seminars and in local meetings for doctors and other health professionals. I do not know to what extent the participants in the implementation study (II) have been exposed to this, but it is likely that some of them have been present in at least one of these settings, though we did not address this in the focus group interviews. Thus their views on relevance for talking about alcohol may have been influenced by my presentations in other settings. Such dissemination is unavoidable when different related research projects are performed consecutively in one specific region, and in a wider perspective it is also intended.

In the implementation study (II) we explored factors relevant for the potential implementation of the results from the practice experiences study (I) in general practice. This implies a conflict of interest, because of my own vested interests in this research. Though not a financial conflict of interest, I am a stakeholder when we are performing research to explore conditions for implementing our earlier findings. This was discussed in the research group, and to reduce the potential direct influence of my participation in the focus group interviews, I only handled the additional focus group interview. I have tried to remain aware of and critical to my own position in the analytical process. This was also aided by our different perspectives, as Eivind Meland, also a GP, had no relation to the practices and did not take part in the practice experiences study, and Sverre Nesvåg, based in Stavanger, as a social anthropologist brought forward other knowledge sources and represented a different stance.

The recruitment of surgeries instead of individual doctors in the implementation study after the first, failed attempt to recruit, was inspired by the concepts of situated learning and communities of practice (69, 70). Offering the participants control of both time and location also enhanced the self-determination aspect of the seminar (68). To further strengthen this aspect, the participants chose the topic for the fourth session by choosing from a list of relevant topics and presenters. The resulting improved recruitment boosted my interest in these perspectives, which also probably

made me more aware of findings supporting this view, and less aware of contrasting findings. This effect was further enhanced by the preliminary analysis. But there is always a risk of self-confirmation, as we created a setting which both enabled and emphasized the phenomena we then explored. Even though we specifically looked for conflict and dilemma regarding both individual factors and system factors in the transcripts, I have later on become more aware of the effect of our preconceptions and the setting we created.

Internal validity

To achieve appropriate internal validity, a study must address the phenomena it is intended to explore, and do so with appropriate methods (1, 111). In the *practice experiences study (I)*, the aim was to explore GPs' reasons for initiating talks about alcohol, and how they chose to do so. Focus group interviews may provide rich and diverse views and opinions, but requires sufficient common ground in the groups, a balance between homogeneity and variation, and a good group dynamic (84, 112). Thus focus group interviews have been found well suited to study the experiences and reflections of practitioners in a field (86). Individual interviews would have enabled in-depth exploration of experiences, reflections and motivations, as well as vulnerable topics like failures and the interviewee's own drinking habits. But it would also require considerably more time and we would have missed the participants' responses to the others' stories (2, 86). Video-taping or audio-taping consultations would have provided better insight in what is going on in the consultation, at the expense of exploring the doctors' perspective.

Our goal was to seek knowledge about different reasons for and ways of addressing alcohol, not to establish how GPs perform this task in average. Still, we were interested in studying doctors with different backgrounds and levels of experience, with stories to tell about how they addressed alcohol. Thus we wanted sufficient variation among participants with relevant experiences, rather than maximum variation, i.e. covering the whole spectrum of GPs' practices (87). As it is not possible to have a complete overview of GPs' motivations for and strategies for

addressing alcohol, it is not possible, nor relevant, to say that we have reached saturation (2). But the purposeful sampling strategy, aiming for variation in age, sex and experience while avoiding the disinterested and the dedicated ones, together with a rich variation in the data, enabled a responsible analysis (2, 86, 87, 113).

We aimed to minimize the social desirability bias and to avoid a generic discussion about what participants think they normally do, and instead specifically asked for recollections of real situations with both failures and successes (84, 85). Still, we do not know what they actually do in these situations, only how they chose to present their recollections in this setting. But the group dynamic and level of interaction in the groups indicate that the stories told gave a good resonance in the groups, both when they had a positive value and a negative value. This indicates recognition and validation from the other group members, and an accepting atmosphere (84).

Professionals who choose to spend a few hours on a busy afternoon on non-paid non-compulsory work-related activities probably have a relatively high level of engagement, in general and may be also in the specific topic, compared to those who refuse to participate. If we were especially interested in recruiting also the least interested doctors we would probably have to choose a less demanding design for the participants, e.g. individual telephone interviews or e-mail interviews. In our case, focus group design enabled us to acquire rich data while at the same time facilitating a hopefully meaningful and relevant discussion for the participants. We judged failures and shortcomings in this field as relatively normal and not very sensitive, and as the majority of GPs in Norway are specialists or in specialty training, they are all accustomed to group discussions through this training (54). Thus our choice of sampling method is valid for what we aimed to explore, and compatible with the participants' previous experiences.

In the *implementation study (II)* the aim was to explore factors relevant for the potential implementation of pragmatic case finding, in the context of learning experiences in a practice setting. We chose a focus group design as this is well suited for the exploration of experiences and reflections (84, 86, 112). Focus group

interviews were also well suited for this specific context for pragmatic reasons, as we could embed the interviews in the seminar. Performing two focus group interviews with each group enabled a further exploration of individual and system factors influencing pragmatic case finding, as we could follow up on previous findings and probe for reflections on pragmatic case finding. In addition, the second focus group interview enabled us to challenge and further explore participants' views on the system factors, in a setting where they had fresh experiences of collective work.

In this study we invited the nine practices already included in the patient record study (III). This implies a risk for weakened internal validity as they were recruited for a different aim, but as they had not played an active part, we judge that this does not significantly weaken the internal validity. But there is a risk that we to some extent have studied the effect of the study context we created, namely the four session seminar. This is a weak point for internal validity. The focus group interviews embedded in the seminar were held initially on the first and third session, to avoid discussions in the groups merely reflecting the content of the seminar.

I did not take part in the interviews related to the seminar to reduce the effects of social desirability, as I both had done the recruiting and much of the teaching in the seminar. The participants' views and reflections were also challenged by the moderator (SN). Still, because this specific seminar created an atmosphere emphasizing cooperation and common understanding, the participants were subject to an intervention highlighting and enforcing the phenomena we aimed to explore. Aiming to balance this we focused specifically on resistance and dilemmas in the material. In addition, dealing with complex drug problems in the surgery was included as topic to elicit potentially negative views and experiences on system factors. This reduces the risk of only eliciting positive views on system factors, and thus strengthens internal validity.

In performing the additional interview we risked losing focus on our main topic addressing alcohol, and thus weakening the internal validity. This is more obvious to me today than it was at the time, and in hindsight we were probably less aware of our

preconceptions regarding the system factors than the individual factors. On the other hand this interview enabled us to explore further the system factors that emerged in the original interviews. In addition, the views presented in the last interview were not affected by the experience of taking part in the seminar with their colleagues. Still, it might be objected that the group conditions are too different to enable a responsible analysis. This is an adequate objection, but the last interview was performed after preliminary analysis revealed rich data on collective strategies for learning and indications of a tendency to avoid sensitive topics both with colleagues and patients. We decided to recruit younger doctors with recent experiences of launching a new surgery as they presumably had many experiences of and reflections on collective strategies for learning and for dealing with sensitive issues. Strategies for addressing alcohol was the backdrop for the last interview, and system factors relevant for the implementation of pragmatic case finding and dealing with sensitive issues the focus. The chosen strategy enabled a more thorough exploration of system factors relevant for the implementation of pragmatic case finding as a new clinical strategy. This additional interview may thus be seen as both weakening the internal validity, while also strengthening the internal validity regarding the system factors.

In the *patient record study (III)* the aim was to explore whether historical data in EPRs might aid in earlier recognition of alcohol related health problems. The data were restricted to historical data from the EPRs. We had no record of the actual state of the patient, and as the data were anonymous, we could not test against registers as the Cause of Death Registry or the Norwegian Registry Database. On the other hand the quality of the data was not affected by any present activity by the recruited doctors. All patients with a sufficiently long and recent record were included, which strengthens the internal validity. The vast number of included patients further strengthened internal validity, as this reduces the importance of the variance.

The quality of the data was also dependent upon the chosen outcome and variables. As outcome we chose comprehensive alcohol use disorder (c-AUD), defined as AUD or a compound word strongly indicating that consequences of drinking had been addressed (AUD text fragment). We tested the validity of the AUD text fragment and

found that it had a sensitivity of 44% and a specificity of 77%, indicating that the AUD text fragment identifies too few, rather than too many, patients with AUD. Another challenge regarding outcome is the fact that GPs more frequently miss than recognize alcohol related health problems (26, 114). As we know nothing of the patients apart from data recorded in the EPRs, we have no way of assessing the true prevalence of alcohol use disorders. This is a significant challenge to the internal validity, though partly amended by the inclusion of alcohol problems that have been addressed, but not diagnosed. Furthermore, there is no reason to believe that all matters addressed in a consultation are documented in codes or in text. Consequently, the interval validity is weakened by both the GPs' ability to identify alcohol related health problems and their documentation habits.

The chosen predictors represent frequent events in general practice. Health-related absence from work is known to be weakly associated with excessive alcohol consumption, primarily for men (99). It is thus relevant to explore, but the challenges we faced concerning this variable weaken the internal validity regarding sick listings. We included ATC-codes of class B medications in Norway, focusing on the event of getting a prescription, and not amounts prescribed. These are mainly benzodiazepines and z-drugs (or non-benzodiazepines, which for all purposes act as benzodiazepines), and milder opioids as codeine and tramadol. The rationale for including class B medications is the combination of their widespread use and their addictive potential, and their potential role in non-diagnosed alcohol use disorder (115). In addition, the use of class B medications is a frequent challenge for the doctor, and though their use is especially prevalent among patients with an established alcohol or drug problem, there is little systematic work done to address potential alcohol or drug problems among patients with repeated prescriptions of class B medications (116). Our decision to focus on getting a prescription as opposed to amounts prescribed probably weakened internal validity. Still, it is in line with the other variables in focusing on the event, i.e. something happening, without quantifying. We did not include other addictive drugs as stronger opioids (class A medications in Norway). Class A medications are far less prevalent and their use is primarily related to short term use,

palliative care or an established serious drug problem, thus their potential as a predictor for a diagnosed alcohol use disorder is probably less relevant. The use of stronger opioids in Norway has recently increased, but given the time frame studied we judge that including these medications would probably weaken the internal validity (115).

Several laboratory tests may indicate excessive alcohol consumption, e.g. mean cell volume (MCV), liver function tests such as gamma-glutamyl transferase (GGT) and carbohydrate deficient transferrin (CDT), though their evidence for use as indicators of alcohol use disorders are low (95, 117, 118). The latter is primarily analysed to assess the course of an established alcohol use disorder, and is thus not relevant in our context. Internal validity was strengthened by the inclusion of MCV and GGT as predictors, and not CDT.

We also used ICD-10 diagnoses with a known alcohol-related fraction as predictors, directly and recoded to ICPC-2 with a consequently lower precision level, as well as ICPC-2 diagnoses where a relation to alcohol consumption is documented in the literature (19, 23, 24, 27, 28). The ICD-10 diagnoses were mainly collected from reports saved in the EPR in different manners during the years. As all practices lie in the catchment area of the same hospital and apply the same EPR software, we know that the time period where reports may be inaccessible because of being scanned as images is fairly short. The large amount of ICD-10 diagnoses collected supports this, thus strengthening the internal validity.

In the final version we excluded all predictor events more than four years prior to the actual predictor event, and repeated all Cox-regressions. This gave stronger correlations, indicating that previous events are more relevant when they are closer in time. While early childhood experiences may significantly affect the adult's health, we have not attempted to include such experiences as predictors (119). In addition, resources and positive life events potentially reducing the significance of past negative events are normally not recorded in a medical record. Given the nature of

the data, focusing on more recent events in the analyses strengthened internal validity.

To assess the clinical relevance of the model, we defined a prognostic index equal to the linear predictor. We hoped to acquire a reasonably high area-under-curve, which would strengthen the clinical relevance (120). This required a time frame for this analysis and the exclusion of patients not fulfilling this criterion. We decided on four years after each event, as we deemed this long enough to have a reasonable trajectory and brief enough to avoid excluding too many events and patients. As in the Cox-regressions we excluded events more than four years prior to the index event. With the findings from the Cox-regression in mind, focusing on recent events strengthens the internal validity of the prognostic index based on the available data (106).

External validity

External validity addresses to what extent the research is relevant beyond the researched context, i.e. transferable (1, 2). Transferability regards the range of and limitations of applicability of the findings in other contexts (111).

The sampling strategy is important both for internal and external validity. The purposeful sampling applied in the practice experiences study (I) aimed at recruiting participants with a balance between variation and homogeneity (84). We avoided convenience sampling. The focus group design and the chosen sampling strategy gave rich data with a sufficient amount and variety of events, enabling a responsible analysis. While we applied a cross-case analytical strategy without a specific theoretical framework, the narrow aim and sample specificity and the strong dialogue in the groups support the relatively low sample size of this study. This strengthens the information power of the study (88). In addition, our findings are probably also relevant for how GPs deal with other complex and sensitive issues where moral and medical issues are interwoven (121-123). Rapley, Abildsnes, Guassora and their respective colleagues present patients' and doctors' perspectives on addressing potentially shameful issues relevant for our findings, thus supporting the external validity.

In the implementation study (II) we recruited participants among the group of surgeries previously recruited to the patient record study (III). In qualitative studies with cross-case analysis, sufficient variation is important (2, 85, 86). In this study, as opposed to the practice experiences study (I), we wanted to reach a broad spectrum of surgeries, and the surgeries from the patient record study (III) were diverse in size and stability. Group practices are the predominant type of practice, and GPs are also frequently engaged in group activities both in continuous medical education and in interdisciplinary patient related activities (54, 124). Thus the group setting was not very different from activities Norwegian GPs are accustomed to, which together with the other above mentioned factors support the external validity of the study.

The participants in the third interview were all from surgeries that recently started or was about to start from scratch. Most young GPs are probably starting their career as a GP in a group practice where they take over a patient list from a senior doctor, which reduces the external validity of our study. But we wanted to study aims and aspirations of younger doctors in general practice relevant for learning and quality improvement. Thus we chose a critical case sampling strategy for this last group, to strengthen the external validity (86). The aim of this study was wider than in the practice experiences study (I), indicating a need for, if otherwise equal, a somewhat larger sample in this study (88). On the other hand the information power is strengthened by a more specific theoretical background for the implementation study (II), in addition to sample specificity and a strong dialogue in the groups. The system factors relevant for the implementation of pragmatic case finding are also relevant for other complex clinical situations dealing with the interface between medical knowledge and personal values and between collective responsibility and personal autonomy. Our findings indicate that the external validity regarding these factors may be stronger for a younger cohort of doctors.

In the patient record study (III), the participating surgeries vary in size and stability, as GP surgeries in Norway do. They ranged from one to seven doctors, and from high to low stability. They shared the same software for their EPR system, and might thus differ from other surgeries applying different systems, but at the time of data

gathering this software system was used by the vast majority of surgeries in our region. There are geographical differences between the major software systems based on tradition and proximity to the developers, but to my knowledge there are no differences between the systems relevant for the external validity of our findings (125). The surgeries were located both in cities and rural municipalities. We judge the surgeries to be sufficient representative for the majority of Norwegian GP surgeries.

As we did not collect data on a sample of the patients, there was initially no risk of selection bias in the patient data. We included all patients with a history of at least four years during the last seven years prior to data gathering. Later on in the analysis we excluded patients without a registered doctor in the surgery at the time of inclusion. This was done because it was not possible to establish whether these patients were still alive or dead, as all patients were anonymized in the data gathering process. There is thus a small risk of selection bias, but in what direction is impossible to know, as we neither know who were still alive nor why they decided to leave the surgery.

Ethical issues

Most evidence indicates that GPs address alcohol too seldom, and if they do, they do not apply systematic methods. The fact that an important factor in many somatic and psychosocial health problems is frequently left out of the doctor's endeavour to improve the patient's health, is an ethical problem. Hence research focusing on the improvement of this situation, aiming for more extensive communication about alcohol between doctor and patient, is ethically justifiable.

We have not performed research on patients per se in any of the studies, but the patient record study (III) is a study on historical data in EPRs. The study was deemed not relevant for approval by the regional ethical committee as the material was anonymized historical data from EPRs. Strategies to ensure anonymization were employed in the data collection, and additional strategies to strengthen anonymization were applied in several later steps in the process leading up to analysis. The initial 8-digit unique code created in the data collection was coincidental and not repeatable. A

new data gathering with the same software in the same surgery would have given all patients a different code. Thus it is impossible, both for the researchers and outsiders, to reverse the process and identify a patient. In addition, information revealing the identity of the participating doctors and their centres are not saved together with the data. This means that the doctors taking part in the study may not be identified. All original data and all versions up to analysis are from the patient record study are saved in secure storage, owned by the research department of Stavanger University hospital.

Still, anonymity alone does not ensure the ethics of the patient record study (III). Ethically justifiable aims are required, but not being able to attain these does not render the research unethical. In our case, we were not able to acquire results enabling the development of a clinical useful tool, but the study has increased our understanding of factors regarding the development of alcohol related health problems, and how the doctor might recognize such a development earlier. My view is that this project was based on justifiable goals, and performed with relevant strategies to ensure patient and doctor anonymity. On the other hand, knowing what I know today I am probably better equipped to perform similar research in terms of reaching significant and relevant results.

In the practice experiences study (I) and the implementation study (II) no patient data were included other than the stories told by the participants. No patients were identified in the interviews, and in the writing process we decontextualized the stories to further ensure that no patients would be recognized by someone else. In addition, the participants agreed to keep all the stories in the interview room. This is similar to participating in the mandatory group activities required for specialist certification in general practice in Norway. We gave the participants aliases in the text, and the lists identifying the participants are saved in encrypted format. The audio files are saved on secure storage in Stavanger University Hospital.

The participants in the focus group studies provided us with their time and devotion, and it is also ethically relevant to consider how we deal with their efforts. In the

practice experiences study (I) we deemed further interviews not necessary, while in the implementation study (II) we performed one additional interview after a preliminary analysis. Besides respecting the participants' time and effort, they were also given documentation of participation, to obtain CME-points (continuous medical education). In the latter study they were also given CME-points for the seminar, but no participants were paid. After publication, the participants were given the published paper.

Discussion of findings

All three studies deal with strategies and preconditions for addressing alcohol in general practice. In the following I will discuss the results from different perspectives. Firstly I will focus on whether addressing alcohol is and should be a task for GPs. Secondly I will discuss a possible basis for and different strategies for addressing alcohol in general practice. Finally I will discuss how improvement may be approached in the absence of strong evidence for any strategy.

Is identification of risky or harmful drinking a task for GPs?

A vast body of research has documented that alcohol is too seldom addressed in general practice, and numerous efforts to improve the situation have failed (46, 58-61, 126). Still, GPs seem to accept responsibility for identifying alcohol related health problems (harmful drinking), but not to accept responsibility for identifying risky drinking (38, 39, 83, 122, 127-131). In the practice experiences study (I) we asked the participants why and how they initiate talks about alcohol prior to the patient's invitation or consent. We did not inquire whether they felt it was their task to inquire about alcohol. In addition to asking based on clinical signs, they reported simple screening measures in routine consultations, e.g. pregnancy check-ups, health certificates, meeting a new patient, though not with validated instruments. This is well in line with findings in a review comparing screening in SBI with clinical signs as identification strategy, as well as with a Danish study on smoking-related health problems (27, 132). The participants in the implementation study (II) told stories on

why and how they address alcohol, in line with the stories gathered in the practice experiences study (I). Neither study may be used to confirm that GPs see addressing alcohol as their task, as this was not addressed per se in the interviews. Our studies add to existing knowledge by describing a wide variety of experiences on addressing alcohol based on clinical relevance and routinely asking, which we have called pragmatic case finding. This concept warrants further exploration and implementation research.

It has been argued by researchers that identification of risky or harmful drinking should be handled by other health care personnel like nurses, as is currently the practice in other health care systems than the Norwegian (55). Screening, be it universal or targeted, is a rather procedural task and probably easier to implement if it is aimed at less autonomous professionals than GPs. On the other hand, a mere technical performance of routine screening or case finding presents serious challenges (133, 134). GPs in Norway meet a majority of their population every year, both healthy and sick. A report shows that for the year 2009, 80% of the population (women more than men) saw a doctor during the year, and 90% of these saw a GP (135). The same report shows that the median number of contacts for those seeing a GP during the year 2009 was 5.5. Our studies indicate that GPs are able to address alcohol in diverse situations.

As our analyses have demonstrated, addressing alcohol may often be a complex task, requiring skills exceeding the skills required for mere screening with validated measures. As such, this is a task highly compatible with the complexities of general practice well known from subject areas beyond alcohol (136). The stories told by the participants of the practice experiences study (I) are stories on how the participants use their clinical knowledge and their knowledge of the patient to address alcohol in a specific situation. A few referred to validated instruments and how they used specific items from these instruments in a concrete situation, without using the instrument as such. Skills, as a combination of knowledge and experience, are developed over time. The examples in this study may be seen as examples of skills, and relates to a definition of skills focusing on the flexible shift between automaticity and awareness

(137). This is well in line with other studies on how GPs perform their clinical tasks in open situations, and how they develop their clinical skills (138).

Alcohol consumption is in many contexts a socially accepted practice, actively controlled by the individual (when addiction is not relevant) and influenced by values, beliefs and expectations (9, 11, 15, 83). Information about safe levels of drinking should then rather be a public responsibility like regulations of price and accessibility, and not a task for the individual doctor. Public health preventive approaches are characterized by the population or segment at interest, as opposed to clinical preventive strategies which are characterized in terms of the stages of the disease or health problem in question (37, 42). In the implementation study some participants focused especially on patients drinking in ways and amounts that did not make sense for the doctor, e.g. drinking in order to get drunk. This implied viewing their own practices, e.g. drinking fine wine at dinners, as normal and other ways of drinking as abnormal (16). This might hamper the doctor's ability to provide relevant information and advice. If communicating safe levels of drinking and identifying those not complying were the main challenge in addressing alcohol, then GPs would not be important actors. But in both focus group studies many participants were focusing on alcohol's possible relevance for the patient's health problem, and not the consumption per se. Several were concerned about social consequences of excessive alcohol consumption, especially for the children, but also for other people in the patient's immediate network. The GP is frequently also the GP for other people in the network, which may enable better insight in the situation and provide more opportunities to help.

The degree of harm of one's drinking is individual, varying considerably between different people, but also varying considerably for the individual over time (13, 22, 24). This intra-individual variance is probably less appreciated, but in my view essential. An individual's alcohol tolerance varies with age, medications, medical problems, mental status and physical status. Thus to assess risk for an individual patient requires knowledge of this particular patient's drinking habits and mental and physical health, as well as his or her previous experiences with alcohol. Our studies

indicate that this is a task well suited for GPs because of the combination of relevant medical knowledge and widespread reach.

Addressing alcohol in the consultation – on what basis?

Dealing with illness, disease and health worries are essential tasks of a GP, and McWhinney includes prevention or health education as one of the nine basic principles of family medicine (36). A concern for the patients' health beyond the presenting problem is pivotal to general practice, and for other health problems like hypertension and diabetes type 2 it is an established clinical practice. In a Swedish population survey one third of the respondents agreed that health care providers (not only GPs) should routinely ask about alcohol, and another third agreed, but on the condition that the patient had presented an alcohol related health problem (139). The participants in the practice experiences study (I) reported several kinds of situations where they routinely asked. Identifying routine situations where addressing alcohol is adequate is thus feasible and firmly based in the GP role, and has some support in public opinion.

The first way of establishing basis for addressing alcohol is based on clinical signs, exemplified with a patient presenting with a health concern or a health problem to be diagnosed, treated or otherwise dealt with. In both focus group studies the majority of stories were about these situations. In the practice experiences study (I), the participants described how they used the patient's symptom, worry, finding or illness as a reason for addressing alcohol. Sometimes they even asked directly for relevant symptoms or worries the patient had not already talked about, to open up for a discussion about alcohol. This implies that they already harboured the idea that alcohol might be a relevant factor for this particular patient in this particular situation. The participants in the implementation study presented many stories in line with this. Previous studies indicate that patients are sometimes more aware of alcohol's possible relevance for their health problems than their doctors, and more in favour of counselling (140, 141). Participants in both studies felt that they missed too many. They are probably right. More recent studies where patients were screened for risky

or harmful drinking and clinicians were asked whether they suspected any of these two conditions found a sensitivity of around 27% and a specificity of 96-98% for the clinicians' suspicion (26, 114). Both studies find that the clinician's suspicion is not adequate, and conclude that general screening is necessary. These studies are a reminder of the present gap between the GPs' awareness and the prevalence of clinical situations where alcohol might be relevant.

Reinholdz et al present a list of the most important early signs, which includes hypertension, marital problems, trauma, anxiety and depression, sleep disturbances and work related problems (27). These are all frequent problems in general practice and compatible with the clinical problems the participants in both studies deemed relevant. In the patient record study (III) we aimed to test whether these clinical problems increased the likelihood of being diagnosed with an alcohol use disorder later on. The final model gave small, but statistically significant, effects of prescriptions of class B medications, sick leaves, elevated gamma-glutamyl transferase and mean cell volume predicting future alcohol use disorder. Although the effects were not strong enough to enable an identification strategy based on the findings directly, the results add to the relevance of exploring whether alcohol consumption might be a factor with repeated incidents of many frequent clinical problems.

A second way of establishing a basis for addressing alcohol is by focusing on that alcohol status is always required to ensure proper diagnosing and treatment for patients. As alcohol is relevant for a multitude of clinical problems, diseases and medications, it is argued that a general screening strategy is required to identify whether alcohol is relevant, even though we do not have strong evidence of neither efficacy nor effectiveness (58). In this line of reasoning the objective of the screening strategy is not primarily to identify and intervene against an alcohol use disorder per se, but to assess whether alcohol must be accounted for when treating the patient's health problem or disease. The strategy would then resemble SBI in the focus on general screening, but with a somewhat different rationale. One challenge is that general screening strategies are not experienced by the GPs as suited for their

setting (52, 54). But perhaps more importantly, such a strategy is different from an open exploration of possible relevance, taking into account both shame and the patient's values. Thus an open exploration based on possible relevance is probably better suited to enable a further discussion than a general screening, though the intentions are comparable. A recent RCT comparing systematic screening with identification based on clinical signs found more risk drinkers in the screening arm, but the patients identified in the clinical identification arm had higher AUDIT-C scores (129). This is in line with our findings, and emphasizes the need to investigate further how relevance may be translated into effect. Our studies add to the base of knowledge by describing pragmatic strategies feasible in general practice, where screening measures are applied together with identification based on clinical signs.

A third way of establishing a basis for addressing alcohol is to treat alcohol consumption primarily as a health risk like elevated blood sugar, elevated blood pressure and elevated blood lipids (83). Rehm et al argue that an identification strategy based on clinical relevance works reasonably well with older patients with established health problems, but it is insufficient for younger patients. They suggest that younger patients should be screened regularly for risky drinking in the same manner as diabetes, hypertension and atherosclerosis is screened for in many settings. The rationale is that by treating alcohol consumption as a risk factor for future health problems, it will be normalized and it will be easier to avoid shame and blame. Still, the same objections as mentioned above are relevant here, as the screening strategies involve the same shortcomings as previously described for SBI (35). Although brief interventions are proven effective, the effect is fairly modest and evident primarily with middle aged white men without addiction, and the link between identification (screening) and intervention is uncertain (45, 46, 56-58). Thus if general screening identifies younger problem drinkers better than a method based on clinical relevance, this may not be readily translated into effect for the patient. In addition, the modest documented effect is primarily on self-reported drinking. There is little evidence of effect on biological parameters, quality of life and morbidity and mortality. On the other hand, the small average reductions in drinking may obscure significant reductions in drinking for some patients. Our findings indicate that aspects of

relevance, clinical or situational, warrants further exploration as a basis for addressing alcohol.

Many screening measures are performed in other settings than general practice. The foundations for and effects of such programmes are increasingly challenged, based on small effects and often considerable side effects (142-144). When screening for risky or harmful alcohol use in general practice the doctor seizes the opportunity to address alcohol, while the patient has not been informed and has not chosen to participate. All screening measures for risky or harmful drinking imply shifting focus from the patient's agenda to the doctor's, and the latter is heavily influenced by outside forces like the medical industry and the health authorities (38, 132). Screening also changes focus from an interest in the patient's story to counting and measuring something else (145, 146).

Trying to follow all guidelines for preventive medicine in general practice might occupy the majority of a normal working day for a GP (80). But it is reasonable to expect patients to be interested in improving their health, both regarding their present problem and in general, when they seek their doctor (36). The challenge for the doctor is thus to provide meaningful information for the patient, without discarding the patient's agenda. This implies exploring whether alcohol might be relevant for this patient in this situation, and how relevance may be utilized to benefit the patient. The doctor's view on relevance and his ability to convey this to the patient is of key importance, but the patients are also thinking subjects making their own connections (132, 141, 147-149). Our participants' stories in both focus group studies are good examples of strategies respecting the patient's agenda while trying to offer help that the patient may not have conceived of previously.

Offering help requires exploring the patient's present health status as well as experiences, beliefs and attitudes concerning alcohol. More complex and sensitive skills are needed beyond merely measuring consumption and signs of harm or addiction (136, 138). Shame is adding to this complexity, and drinking alcohol may be a shameful and vulnerable issue (123). Our participants' stories show how they

may deliberately avoid asking, based on a fear of harming or alienating the patient. Sometimes the drinking itself is the shameful issue, and sometimes excessive alcohol consumption is a coping strategy when dealing with other shameful and vulnerable issues, thus addressing alcohol consumption may come across as ‘blaming the victim’ on more than one level (119). This is important to keep in mind when aiming to increase rates of identification and intervention and adds further to the necessity of developing patient centred strategies for identification. Self-determination theory, while in this dissertation primarily applied on the doctor’s perspective, offers a theoretical understanding and strategies well suited for the challenges described above (62).

Is improvement possible?

In the practice experiences study (I) we identified two distinctly different kinds of situations where the participants addressed alcohol, firstly where alcohol might be clinically relevant, and secondly routine consultations where addressing alcohol was relevant. We coined the combination of these strategies *pragmatic case finding*. The main element in pragmatic case finding is clinical relevance, meaning that the doctor addresses alcohol when it is relevant for the patient’s worries, illness, disease, treatment, health in general or potential harms to others. This is probably not very different from case finding regarding smoking, or conditions like type II diabetes and hypertension. Examination, treatment or follow-up for illnesses, diseases and health worry is a core task for a GP (38). But patients also seek their doctor for routine tasks. I have shown that pragmatic case finding sits well with the GPs’ role and tasks, and is probably acceptable to patients.

But the concept of pragmatic case finding is primarily a framework, where the clinical understanding of when alcohol may be relevant is based on medical knowledge, continuously developing. The doctors in the focus group studies felt that they addressed alcohol too seldom, a fact that to some extent also was evoking shame. A feeling of inadequacy, if it is not too shameful, may be an important basis for improvement. Focusing on addressing alcohol more frequently in the clinical

situations where they already think it is relevant is an adequate starting point. Pragmatic case finding also provides an opportunity to expand on the doctors' knowledge of relevant clinical situations, and thus connect the new knowledge to their existing knowledge and line of thinking. In other words, if addressing alcohol when clinically relevant is an accepted and feasible strategy, then offering more knowledge on clinically relevant conditions and health problems is a plausible strategy to improve identification. This is different from applying large efforts in persuading GPs to screen for risky or harmful alcohol consumption (53, 61).

On the other hand, a couple of the participants in the implementation study (II) criticized the lack of structure in pragmatic case finding, and called for more predefined strategies and hard evidence of effect. This emphasizes the need for a comprehensive tool box, and is relevant also in a self-determination perspective. Validated tools as AUDIT and CAGE belong to a comprehensive tool box, and for some patients and some situations they are relevant, sometimes for identification and sometimes for further assessment. When such tools are adequate, and how they may be utilized in patient centred ways, warrants further exploration. If the doctor feels free to use the type of strategy for addressing alcohol that he deems appropriate in a given situation, he may be more likely to address alcohol (39, 68). Regarding skills as based on awareness and automaticity, application of tools when applicable will gradually result in development of the skill and the tool itself may thus in due course be less important (138).

The recent disappointing results for several comprehensive efforts to implement screening strategies in general practice warrants a closer look also at potentially relevant system factors in general practice (59-61). All these studies targeted the surgeries, which was the unit for randomization. Knowledge of the contexts where new skills are developed is necessary to achieve improvement of quality. Our findings from the implementation study (II) emphasizes how the practice setting may provide opportunities for implementing new strategies, by identifying and building on collective strategies for learning and quality improvement that are already in place.

Communities of practice has recently gained interest as a valid strategy for research and quality improvement (74). Soubhi et al describe collective learning and communities of practice in the context of caring for patients with multi-morbidity (73). The level of interaction and collective learning described in their paper is extensive, but it is still relevant, and some practices in the implementation study (II) employed elaborate collective strategies for learning and quality improvement. The recent studies aiming to improve the identification of alcohol related health problems by addressing GP surgeries emphasizes the relevance of exploring factors influencing collective learning and quality improvement in GP surgeries (59-61). Improvement strategies based on current activities in general practice may be more feasible, and also provide an opportunity to offer teaching tailored to the needs of the doctors. This is in line with self-determination theory, as it focuses on two of the three basic psychological needs, i.e. the needs for competence and autonomy (68). Pragmatic case finding provides a framework for quality improvement in line with this theory, as it requires skills they already possess, regarding a clinical problem they find relevant, but not proficient in dealing with (39). The third basic psychological need in SDT, the need for relatedness, is equally important. This was addressed in the implementation study, as we deliberately recruited practices instead of individual doctors, and addressed the seminar to the practices.

Community of practice is a relevant concept, providing a better understanding of work cultures and tacit processes in the GP clinic and how change and quality improvement in this setting may be fostered (70). In the practice experiences study (I) we focused on the individual doctor. Self-determination theory provides a framework for understanding the role of the individual doctor. When expanding the perspective to the surgery, this theory is still valid as a supplement to the perspectives of situated learning and communities of practice. The collective strategies described in the implementation study (II), more prevalent in the larger surgeries, are especially relevant for improving skills necessary for addressing alcohol. The ambition to jointly improve their practice by discussing and learning from each other is relevant because of the interface between medical knowledge, values and attitudes, but the tendency to sometimes avoid vulnerable topic should be addressed. Community of practice

provides a framework for understanding and building on their own strategies in efforts to improve clinical practice, and indicates that dealing with a complex topic as alcohol talks together may strengthen the surgery as a community of practice. In the understanding of self-determination theory, such efforts may also be autonomy-supportive, both on an individual and on a system level (68, 70, 73).

In the implementation study (II) we addressed both individual and system factors affecting the implementation of pragmatic case finding. The participants focused on time as an opportunity, not only a challenge, and their own ability to control the time frame even though they are certainly pressed for time. They also stressed normality as an opener, as the fact that most people in Norway today are drinking alcohol provides a ground for addressing alcohol without focusing on misuse or addiction. This gives an opportunity to discuss potential negative effects of the patient's drinking without focusing on abuse or addiction. While we have not explored discussions about the positive aspects of alcohol, these are also important to address. Template-based strategies, such as the use of validated tools in SBI, have been shown to impede open discussions with patients and may thus be a barrier to establishing grounds for an open discussion of alcohol (52). The GP's values and beliefs may impede understanding of the patient's perspective, as shown by participants in the implementation study (II). On the other hand, consciously acknowledging one's own position may facilitate exploration of the patient's perspective (16).

Recently I have realized that the fact that most Norwegian doctors have personal experiences of drinking alcohol, imply a user perspective which may be consciously applied in clinical practice, thus supporting the normality aspect (10). But if the main focus of the doctor is, as shown by Vinson et al, to identify signs of an alcohol problem, many clinical situations related to alcohol may be missed (26). Focusing on potential relevance in the specific situation instead of signs of an established alcohol problem will probably support the normality aspect and reduce shame (123, 150). Still, studies have shown that GPs sometimes deliberately use rhetoric manipulation and other paternalistic approaches to stimulate a healthier lifestyle (121). Lack of

awareness on one hand and a tendency to enforce change on the other, are challenges that have to be dealt with when struggling to improve practice in this field.

Addressing alcohol more frequently in the context of exploring relevance, will give the doctor ample opportunity to improve skills, support the normality aspect and expand the patients' knowledge on potentially alcohol-related health problems. This implies to see alcohol as a potentially complicating factor in many clinical situations, and not necessarily a cause. Our studies indicate that focusing on relevance may provide a viable basis for better recognition of alcohol related health problems, and that pragmatic case finding is feasible in general practice and well suited for improvement strategies aimed at the GP surgery.

6. Conclusions

General practitioners apply a wide range of strategies when addressing alcohol, strategies that are adapted to their personal style and the specific setting. Addressing alcohol is frequently motivated by clinical relevance for the patients' present health complaint, but in some routine encounters they also apply simple screening measures. The concept of pragmatic case finding describes the combination of addressing alcohol based on clinical relevance, and in some routine encounters.

Factors facilitating the implementation of pragmatic case finding in general practice are the focus on clinical relevance instead of general screening, the emphasis on normality and the possibility of adapting the time frame and spacing of consultations to the patients need. On the other hand the aspect of shame, time restrictions in a busy surgery, a focus on alcohol as something special and a tendency to avoid tension and conflict are essential barriers. Important system factors that may affect the implementation of pragmatic case finding are the degree of collective strategies for quality improvement and learning in a group practice, and how they deal with complex issues and potential controversial topics.

Many mental and psychosocial diagnoses, new sick leaves and prescriptions of addictive drugs, may play a role in the development of alcohol use disorder. The effect sizes in our study are too small to enable the development of a clinically relevant tool for earlier identification of alcohol related health problems. But general practitioners should be aware of alcohol as a potentially relevant factor with repeated events of many frequent clinical problems.

An open exploration based on possible relevance is a good starting point for a further discussion about alcohol.

7. Implications for clinical practice

It is well established that alcohol plays a part in many health problems and diseases and that alcohol is not adequately addressed in general practice. Our research indicates that an identification strategy based on clinical relevance and targeted screening is feasible in general practice and well adapted to strategies already in use. Pragmatic case finding is a framework enabling improvement by expanding knowledge on the multitude of clinical situations where alcohol may be relevant. Many frequent events in general practice may indicate vulnerability for developing an alcohol related health problem, and thus should prompt the GP to explore whether alcohol might be relevant for the patient's health. Focusing on how alcohol consumption may be relevant for many conditions emphasizes normality instead of abuse and addiction, thus enabling a respectful and open dialogue with the patient about alcohol. A group practice with collective strategies for learning and quality improvement is a well suited arena for improving knowledge and skills in identifying when and how alcohol may be relevant for the patient. Open and respectful dialogues on sensitive issues are important prerequisites, both between colleagues and between patient and doctor.

8. Future research

Many research papers deal with the effect of screening and brief intervention, but there is significant uncertainty of the relationship between screening and intervention, and of the effectiveness in real world practices. Pragmatic case finding as identification strategy should be tested in randomized trials. This would also be a relevant starting point for an examination of intervention effects. Splitting this into two different stages might enable increased knowledge of the relationship between the identification and specific intervention strategies, applicable in the specific setting, be it general practice or other general clinical settings.

In all three studies we have focused on the doctor. Research projects exploring the patient's perspective on 'being identified' are highly relevant for improving practice. It is eventually the patient who must make sense of the doctor's efforts, and if these efforts do not make sense, or instigate feelings of shame or failure, they may be of little help. Exploring the patients' perspectives will also enhance our knowledge on how gender, age, ethnicity and economic factors may influence identification and intervention.

Health care is increasingly integrated, and many significant actors play a role in a patient trajectory. Research addressing integration and cooperation, both in the specific arena as general practice and between settings, are necessary to identify how practice may be improved and how important qualities of today's practices may be secured and developed further.

Finally, the electronic patient record is an increasingly important tool, both for documentation, learning, integration and communication. Research focusing on the learning potential in these records, and how information in the records might be used to improve practice, are needed.

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Appendix A

ICPC2 and ICD10 codes for outcome diagnoses and for independent variables in study III

Outcome - Alcohol use disorders ICD10 (24)

E24.4 Alcoholinduced pseudo-Cushing's syndrome

F10 Mental and behavioural disorders due to use of alcohol

F10.0 Acute intoxication F10.00-F10.07

F10.1 Harmful use

F10.2 Dependence syndrome F10.20-F10.26

F10.3 Withdrawal state F10.30-F10.31

F10.4 Withdrawal state with delirium F10.40-F10.41

F10.5 Psychotic disorder F10.50-F10.56

F10.6 Amnesic syndrome

F10.7 Residual and late onset psychotic disorder F10.70-F10.75

F10.8 Other mental and behavioural disorders

F10.9 Unspecified mental and behavioural disorder

G31.2 Degeneration of nervous system due to alcohol

G62.1 Alcoholic polyneuropathy

G72.1 Alcoholic myopathy

I42.6 Alcoholic cardiomyopathy

K29.2 Alcoholic gastritis

K70 Alcoholic liver disease

K70.1 Alcoholic hepatitis

K70.2 Alcoholic fibrosis and sclerosis of liver

K70.3 Alcoholic cirrhosis of liver

K70.4 Alcoholic hepatic failure

K70.9 Alcoholic liver disease, unspecified

K85.2 Alcohol-induced acute pancreatitis

K86.0 Alcohol-induced chronic pancreatitis

O35.4 Maternal care for (suspected) damage to fetus from alcohol

P04.3 Fetus and newborn affected by maternal use of alcohol

Q86.0 Fetal alcohol syndrome (dysmorphic)

R78.0 Finding of alcohol in blood

T51 Toxic effect of alcohol

T51.0 Ethanol

T51.1 Methanol

T51.9 Alcohol unspecified

X45 Accidental poisoning by and exposure to alcohol

X65 Intentional self-poisoning by and exposure to alcohol

Y15 Poisoning by and exposure to alcohol, undetermined intent

Outcome - Alcohol use disorders ICPC2. Converted from ICD10 above.

P15 Chronic alcohol abuse

P16 Acute alcohol abuse

A23* Risk factor NOS

A86* Toxic effect non-medicinal substance

A90* Congenital anomaly nos/multiple

A99* Disease/condition of unspecified nature/site

D87* Stomach function disorders

D97* Liver disease NOS

D99* Disease digestive system other

K84* Heart disease other

N94* Peripheral neuritis/neuropathy

*Only when the word 'alcohol' in different versions is included in the diagnostic text

Predictor events - Alcohol related diagnoses, ICD10 (24)

C00-C14 Malignant neoplasms of lip, oral cavity and pharynx

C15 Malignant neoplasm of oesophagus

C32 Malignant neoplasm of larynx

G40-G41 Epilepsy and status epilepticus

I10-I15 Hypertensive diseases

I47-I48 Cardiac arrhythmias

I60-I62, Haemorrhagic stroke

I85 Oesophageal varices

K22.6 Gastro-oesophageal laceration-haemorrhage syndrome

K73, K74 Liver cirrhosis

K85, K86.1 Acute and chronic pancreatitis

L40 exl L40.5 Psoriasis

O03 Spontaneous abortion

Predictor events - Alcohol related diagnoses, ICPC-2. Converted from ICD10 above.

D77 Malignant digestive neoplasm other/NOS

D87 Stomach function disorder

D97 Liver disease NOS

D99 Disease digestive system other

K78 Atrial fibrillation/flutter

K79 Paroxysmal tachycardia

K80 Cardiac arrhythmia NOS

K86 Hypertension uncomplicated

K87 Hypertension complicated

K99 Cardiovascular disease other

N88 Epilepsy

R85 Malignant neoplasm respiratory other

S91 Psoriasis

W82 Abortion spontaneous

Predictor events - Other ICPC-2 diagnoses, with evidence for a possible causal relation to alcohol consumption (23, 27)

D07 Dyspepsia/indigestion

N01 Headache

P01 Feeling anxious/nervous/tense

P06 Sleep disturbance

P18 Medication abuse

P74 Anxiety disorder/anxiety state

P76 Depressive disorder

Z12 Relationship problem with partner

Z13 Partner's behaviour problem

Z16 Relationship problem with child

Z20 Relationship problem parent/family member

Z21 Behaviour problem parent/family member

Z24-29 Relationship problem friend, assault/harmful event problem, fear of a social problem, limited function/disability, social problem

A80 Trauma/injury NOS

F75 Contusion/hemorrhage eye

F77 Injury eye other

H78 Superficial injury of ear

H79 Ear injury other

L72-81 +

L96 Fractures, sprains, dislocations etc

N80 Head injury other

S16 Bruise/contusion

S18 Laceration/cut

S19 Skin injury other

APPENDIX B