UiT
THE ARCTIC UNIVERSITY OF NORWAY

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Exploring the gender specific association between use of complementary and alternative medicine and alcohol consumption and injuries caused by drinking

The sixth Tromsø Study

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HEL-3950 Master's thesis in Public Health
August 2017

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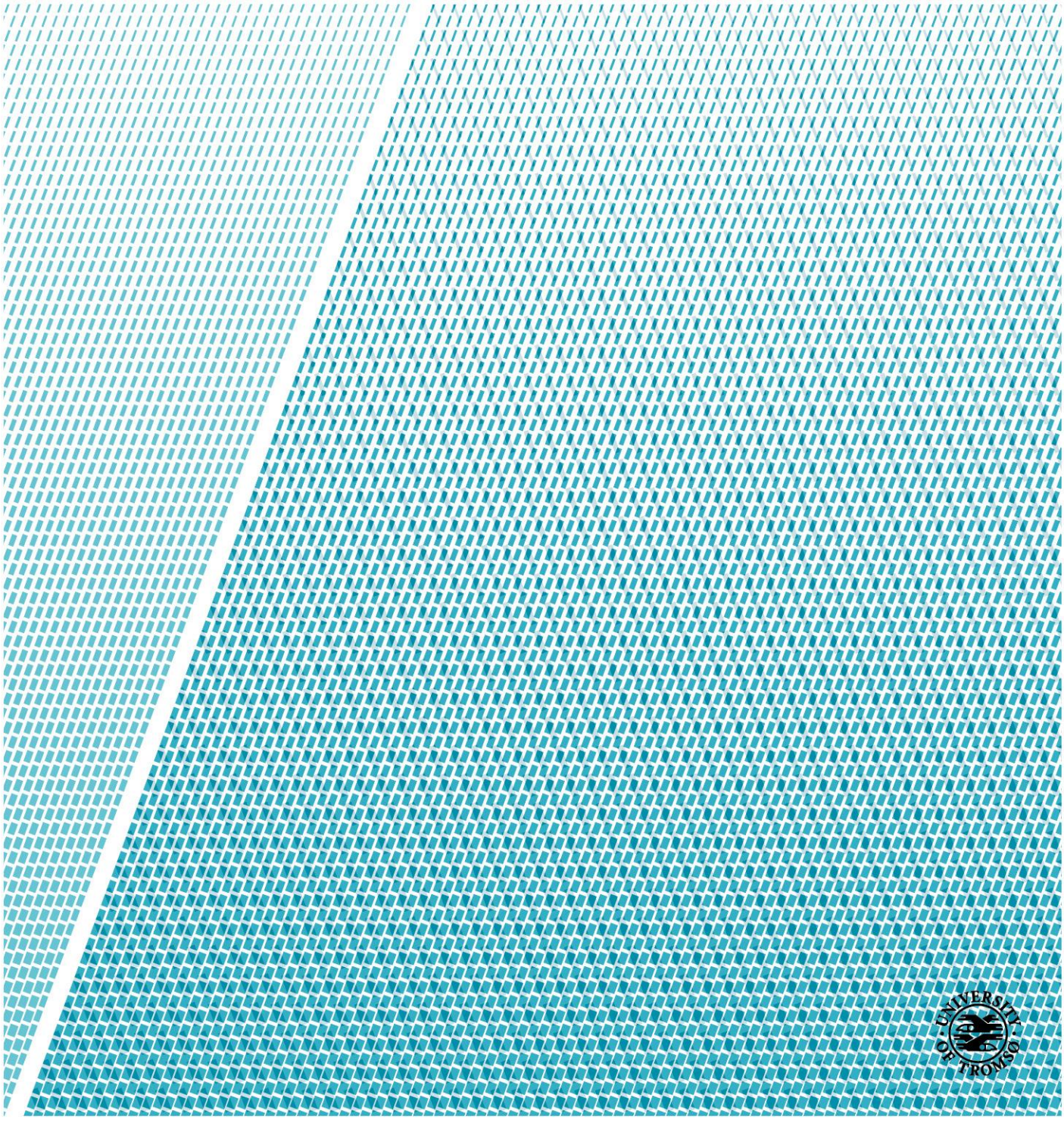

Acknowledgment

This thesis concludes my two-year master degree in Public Health at UiT, the Artic University of Norway. The last two years have been an inspiring and amazing experience, that has allowed me to get a new perspective on health compared to my work as a nurse. I have looked forward to every day, learning something new and interacting with knowledgeable professors and students. The international and multidisciplinary environment in our classroom has challenge my ideas and been a huge resource to me as a person as well as a student.

Many people deserve a big thank you for guiding me along the way in this thesis. First and foremost, I would like to give thanks to my supervisor Agnete Egilsdatter Kristoffersen, for guidance and feedback during my master thesis. I am so grateful to have been able to work with such a knowledgeable and engaged researcher. To my co-supervisor Marko Lukic, who's door was always open, thank you for all your help, encouragement and post-master optimism. A big thank you is also in order to the Tromsø Study team and its participants.

I would also like to thank my fellow students, for their support, friendship and humour through good times and bad. I will miss you. And finally, last but by no means least, a big thank you to my boyfriend, for faith and motivation when needed.
To all of you, thank you! I could not have done it without you.

Tromsø, August 2017.

Kristina Sivertsen

Abstract

Background: Previous studies have found that the use of complementary and alternative medicine (CAM) is associated with several characteristic, such as female gender, higher education and higher income. However, studies investigating the relationship between alcohol consumption patterns and different CAM approaches have so far been limited. Harmful use of alcohol has detrimental consequences to individuals and society in Norway. CAM on the other hand may play an important role in disease prevention and health promotion, however, due to gaps in the knowledge about CAM and CAM users its role in many areas remains unclear. Increased knowledge about the use of different CAM approaches and its association to alcohol consumption could be valuable when preventive measures against harmful use of alcohol are planned and carried out.

Objective: The aim of this study is to describe and compare alcohol consumption and injuries related to alcohol across gender and use of different CAM approaches (alternative practitioner, herbal or "natural" medicine or self-treatment with CAM).

Data and method: The data used in this thesis is gathered from the sixth Tromsø Study. The study was conducted in the municipality of Tromsø between 2007 and 2008 and the data used in this thesis is obtained from questionnaires. Information on CAM and alcohol consumption was available for 6819 women and 5994 men, 64.8% of the invited individuals are included in the current thesis. The descriptive statistics were preformed using chi-square and independent sample t-tests. Binary logistic regression analyses were used to investigate the associations between the different CAM approaches and alcohol consumptions and injuries caused by drinking. The binary logistic regression analyses were adjusted for age, level of education, household income and self-reported health. Main analyses were stratified by gender.

Results: The main analyses revealed that the women who reported drinking alcohol 2 times a month or more frequently were more likely to have applied herbal or "natural" medicine and

self-treatment techniques, compared to those who never drank, and those who only drank monthly or more infrequently. An association was also found between having experienced injuries to themselves or others because of their drinking and use of self-treatment techniques and visit to a CAM practitioner, for women. No association was found between amount of alcohol consumed when drinking and the use of CAM approaches. Among the men, an association was found between injuries caused by drinking and the use of herbal or "natural" medicine. No other relationship was found for men.

Conclusion: Contrary to our predictions, the findings from this cross-sectional study suggests that women who drink more frequently are more likely to use herbal or "natural" medicine and self-treatment techniques. Both women and men who have experienced injuries cause by their drinking are more likely to have used some CAM approaches. The study does not draw any conclusions regarding causality.

Key words: Complementary and alternative medicine, CAM, herbal medicine, self-treatment, alternative medical practitioner, alcohol consumption, alcohol-related injuries, cross-sectional study, The Tromsø Study.

Abbreviations

AIDS	Acquired immunodeficiency syndrome
BMI	Body mass index
CAM	Complementary and alternative medicine
CI	Confidence intervals
CVD	Cardiovascular disease
HIV	Human immunodeficiency
ICD	International classification of disease
NAFKAM	National Research Center in Complementary and Alternative Medicine
NOK	Norwegian kroner
OR	Odds ratio
REK	Regional Committee of Medical and Health Research Ethics
SIRUS	The Norwegian Institute for Alcohol and Drug Research
UiT	University of Tromsø
WHO	World Health Organization
15+	Over the age of 15

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1 Introduction

1.1 Alcohol

1.1.1 Alcohol consumption in the world

Alcohol is colloquially defined as beverages containing ethanol (ethyl alcohol) in an amount equivalent to more than 2.5 percent by volume (1). Alcohols are consumed almost worldwide and is the most widely used recreational drug in the world (2). However, alcohol consumption varies across countries and cultures and there are wide variations within global estimates (2, 3). The highest levels of consumption are found in Europe, second highest in the Americas, while intermediate alcohol consumption levels were found in the Western Pacific Region and in African. The lowest levels were found in South-East Asia, and especially in the Eastern Mediterranean (2).

In general, the estimates show a clear trend towards that the wealthier the country, the more alcohol is consumed and less people are abstainers. High income countries also have the highest per capita alcohol consumption and the highest prevalence of episodic drinking (2, 3). The reasons for this are considered complex, including sociodemographic factors, level of economic development and culture (2). For instance, in the Eastern Mediterranean Region, where alcohol consumption is lowest, the predominance of Islamic states is a likely explanation of the low level of consumption (4). Some countries within South-East Asia and in the Eastern Mediterranean, unrecorded alcohol consumption makes up for half of total alcohol consumption (2).

In other societies, alcohol has been an integrated part of culture for thousands of years, and still plays an important cultural and social role (5). Moderate alcohol consumption has also been associated with some positive health outcomes, such as cardioprotective effects (6-8) and decreased risk of type two diabetes (9-11). However, findings have been ambiguous (12, 13) and it is suggested that the negative outweigh possible beneficial health outcomes (3). Studies have also found that the pattern of drinking affects risk of harm (14, 15), and that benefits associated with low and moderate drinking disappears if heavy episodic drinking (consumption of ≥60 grams of pure alcohol or ≥5 units on single occasion at least monthly (2)) is present (9, 16, 17).

Harmful use of alcohol is known to cause a large disease, social and economic burden on society (2, 18). Despite varying estimates of alcohol use, most countries show substantial disease and death rates attributed to alcohol consumption (2, 3). Studies show that throughout the world, harmful alcohol use is among the five leading risk factors for disease, disability and preventable death (2, 19, 20). It is estimated that alcohol consumption contributes to 7.4% of total diseases burden for men and 3% for women (2).

Alcohol consumption is a risk factor for many diseases and health related problems, such as alcohol dependency, liver cirrhosis, injuries (21), cancers (22, 23), foetal alcohol syndrome and other complications during pregnancy (24). Alcohol can also interfere with medical treatment and accelerate the progression of disease (21, 25). Recent research has also shown a relationship between alcohol drinking and infectious diseases, such as tuberculosis and

Human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) (25-28). In total, alcohol has been identified as a component cause for more than 200 of the International classification of disease (ICD) codes and more than 30 include alcohol in their name or definition (29). Furthermore, the burden of harmful use of alcohol is not restricted to individuals and health, major strains are also put on societal response to problems, including health systems, criminal justice systems and unemployment and welfare systems (2). It is estimated that social alcohol-attributable costs represent 1.3% to 3.3% of the gross domestic product (3).

Europe, constituting only 14.7% of the world's population over the age of 15 years, consume about 25.7% of total alcohol consumption worldwide. However, while global alcohol consumption continues to grow, there has been a decrease in Europe (from 12.2 litres in 2005 to 10.9 litres in 2010 (2). The WHO also predicts that these numbers are expected to decline further within 2025 (2). Noteworthy, there has also been a reduction in adolescent drinking in Europe (30, 31). This might represent a generational shift in alcohol consumption seeing that teenage drinking is predictive of alcohol consumption in adulthood (32). The decline is likely due to public health campaigns targeting adolescents and increased understanding and knowledge about the negative effects of alcohol (33).

In recent years there has been a growing support for more restrictive alcohol policies in many countries around the world (2). Apart from Denmark, the Nordic countries have had relatively restricted alcohol policies, compared to the rest of Europe (34). Traditionally, Norway is one of the Western countries with the most restrictive alcohol policies (35). This trend has

however change within the last decades, and in Norway we have witnessed a gradual liberalization of alcohol policies. Increased number of the Norwegian Wine and Spirits Monopoly stores and on-premise licenses together with increased quotas for private untaxed import has led to an increased availability of alcohol (1, 35).

1.1.2 Alcohol consumption in Norway

In 2016 it was reported that Norwegians over the age of 15 (15+), drank on average about six litres of pure alcohol per year (36). When unrecorded consumption, such as border trade and tax-free commerce were included, the number is estimated to be about 7.7 litres per inhabitant (15+) (1, 2). Compared to other European countries these estimates are relatively low, where average consumption per capita (15+) in the European region was 10.9 litres of pure alcohol (2, 30). Countries adjacent to Norway, such as Denmark and Sweden, had an average consumption of 11.4 and 9.2 litres per capita (15+), including unrecorded consumption (2). Nevertheless, alcohol consumption in Norway has largely followed the European trend, with increasing estimates since the beginning of the 1990s followed by decreased consumption in recent years (36-38). The increased consumption during the 90s, were likely due to several factors, including increased household income relative to alcohol prices, the introduction of the cheaper bag-in-box wine of 3 litres and general increased availability of alcohol (35, 37, 39). Everyday drinking has also become more common in Norway, while heavy episodic drinking on the weekends have persisted (15).

Despite liberalization of alcohol policies and consumption, there has been a declining trend recent years and total alcohol consumption per capita in Norway (15+) has been decreasing

since 2008 (36). Norwegians have also been increasingly supportive of restrictive alcohol policies since the millennium, both towards policies that have been liberalized and policies that have stayed stable (35, 40). This could be a reaction to the increasing prevalence of hospitalization and other alcohol related harms on society the last decades (35, 38, 40, 41). It could also be a result of public health campaigns, believe in the effectiveness of restrictive policies and an increasing focus on health and health related behaviours (40).

According to the Norwegian Institute for Alcohol and Drug Research (SIRUS), alcohol consumption has detrimental consequences to both individuals and society in Norway. In addition to disease and deaths directly caused by alcohol consumption, alcohol also contributes to death and hospitalization in an indirect manner, in terms of physical and mental illness, accidents, self-inflicted harm and violence (1). In 2014, it was estimated that alcohol consumption had contributed to 239 deaths of which 135 where alcohol was the main cause of death (38), 239 of the deceased were men while 81 were women. Alcohol consumption also lead to hospitalization of 6 375 people in 2014, of which 4322 were men and 2053 were women (38). The same year, a total of 5869 Norwegians were suspected of driving under the influence of alcohol and/or other intoxicants, were a clear majority were men (n=5056) (38). Gender discrepancies were also present in average alcohol consumption, were men report drinking almost twice as much as women. Beer accounted for more than half of alcohol consumption for men, while the majority of women reported drinking wine (1).
Even though the alcohol consumption is relatively low in Norway, drinking culture is characterized by heavy episodic drinking (38), which can have more serious health effects

(14, 15). In planning and monitoring health care, knowledge about people's drinking habits could be highly relevant and useful to public health and public health professionals.

1.1.3 Alcohol consumption and the Tromsø Study

The consumption of alcohol has been of interest to health professional and health research for many years. In the Tromsø Study, the most comprehensive population study in Norway through the last 40years, there has been conducted several studies on alcohol consumption.

Sexton and colleagues found that general drinking was associated with subsequent depressed mood although an opposite association was found among female moderate drinkers. They also found that younger people were on average likely to drink more than older people (42). Brenn et al suggested that alcohol consumption was favourably associated with coronary risk factors (43). Both studies found gender difference in alcohol consumption and the health-related risks associated with consumption, supporting separate analyses for males and females. A more recent study based on data from the fourth and fifth Tromsø Studies also found that light-to-moderate wine consumption was associated with better performance on cognitive test after 7 years of follow up compared with low alcohol consumption (44). Results from the second to fifth Tromsø Studies showed that higher level of alcohol intake and years of education had significant linear inverse association with the metabolic syndrome, but just for women (45). A study based on results from the third Tromsø Study indicated that modest and simple interventions may change drinking behaviour in early-stage risk drinkers (46). Furthermore, Hansen-Krone et al found that liquor consumption and binge drinking was

associated with increased risk of venous thromboembolism and the risk increased with the frequency of binge drinking, while wine consumption of three or more units per week was associated with a 22% reduced risk (47). All studies show that general alcohol consumption is relatively low in the Tromsø Study population, reflecting the modest alcohol consumption in Norway.

1.2 Complementary and alternative medicine

1.2.1 Definition

Definition of complementary and alternative medicine (CAM) often differ across countries and organizations. According to the World Health Organization (WHO), CAM is defined as a broad spectre of health services that are not incorporated in a countries traditional health care system and is not part of public health services (48). In Norway, a CAM provider is commonly known as a practitioner that offers CAM both as alternative and complementary to conventional treatment. As such, the CAM provider offers therapies that are not usually a part of the public health care system and are paid by out of pockets payments (49). CAM providers may encompass a variety of different therapies, however, the most commonly reported modalities in Norway includes massage, acupuncture, naprapathy, reflexology, osteopathy, cupping and spiritual healing (50). In this thesis the definition of CAM, will be in accordance with the Norwegian law on alternative treatment, Lov om alternativ behandling mv (2003-06-27-64) (51):

"Alternative treatment is understood to mean health-related treatment which is practised outside the established health services and which is not practised by authorised health personnel. However, treatment practised within the scope of the established health services or by authorised health personnel is also covered by the term alternative treatment when the methods used are essentially methods that are used outside the established health services." (52).

1.2.2 Complementary and alternative medicine worldwide

Complementary medicine is used worldwide, but have often been an underestimated part of health care. More countries are now increasingly recognizing and accepting complementary and alternative medicine's contribution to individual's health and well-being, as well as its contribution to health care systems (48). In the last 30 years there has been an increasing interest and use of CAM particularly in Western societies (53-58). In a systematic review from various studies conducted in Europe, recorded prevalence ranged, however, from 0.3% to 86% (58). CAM is very heterogeneous in regards to definitions, legislation, people's attitudes, needs for CAM and provision of CAM across different countries (58). The huge differences in prevalence are likely due to differences in study design, methods of data selection or/and differences in the definitions of CAM (58). The challenges with comparisons across studies on CAM has long been recognized and strategies to ease this problem have been suggested by a European research team on CAM (58).

CAM is often used by people suffering from chronic conditions or life-threatening and serious illness, such as cancer (49, 55, 59, 60), chronic pain (61, 62), mental disorders (63, 64) and/or in situations when conventional treatment options have been limited (62). A systematic review have shown that CAM use is linked to wanting to reduce side effects of conventional treatment, unsatisfactory results from conventional treatment and to assist disease management in people with chronic diseases (65). However, motives for use also include a range of other reasons, including using CAM as preventive therapies, CAM being more congruent with their personal belief system, CAM's ability to provide hope, the notion that CAM offers a more holistic view of health care, the therapeutic value of CAM, more emphasis on patient control and a perception that CAM practitioners offers a more supportive role compared to conventional health care personal (65).

1.2.3 Complementary and alternative medicine in Norway

In accordance with other Western countries there has been a strong increase in the use of CAM in Norway the recent decades (57, 66, 67). During the 1990s there was a shift, where both political policies and people's attitudes towards CAM changed, which led to an increase in the application and interest for CAM. In 1997, the Norwegian Ministry of Health and Social Affairs appointed a Committee, commonly known as 'Aarbakke-utvalget'. The purpose of the committee was to examine various aspects of alternative treatment. The Committee drafted their report in 1998 (NOU 1998) (68), which later laid the foundation to a change in legislation and the new law on alternative treatment was passed in 2004. In 2000, a

national research and documentation center, NAFKAM, was also established in the wake of this report (69). NAFKAM has played a major role in national and international CAM research (58).

Compared to Norwegian surveys conducted in 2012, 2014 and 2016, the increasing trend of CAM use now appears to have turned (50, 57, 70). The most recently conducted national survey on CAM use in the general adult population, found that 36% of the participants had used some kind of CAM therapy, during the last 12 months, compared to 45.3% in 2012 and 40.1% in 2014 (50, 57, 70). Of these 24% had visited a CAM provider in 2016, compared to 36.6% and 29.6% in 2012 and 2014 respectively. While there was seen a decline in individuals visiting CAM providers in the recent surveys, the reported use of self-treatment techniques, such as meditation, yoga, qi gong or tai chi, increased between 2012 and 2014 and stayed stable from 2014 to 2016. The use of supplements stayed stable between 2012 and 2014 (70%) and had a slight decrease in 2016 (66%). The use of herbal remedies was stable from 2012 to 2016 according to the national surveys (50, 57, 70). The reasons for the recent decline in CAM use is believed to be connected to the increased awareness and emphasis on scientific evidence in the social debate and among CAM users (50).

Interestingly, there has been an increase in CAM expenditures from 2014, indicating that a smaller part of the population is spending more money on their CAM treatment or using other more expensive therapies. Estimates suggests that the Norwegian population used about 4.2 billion Norwegian kroners (NOK) on CAM in 2016, which translates to 974 NOK, per inhabitant (50).

In the sixth Tromsø Study, conducted in 2007/2008, Kristoffersen et al found that a total of 33% of the participants reported any CAM use within the last 12 months and 13.1% had visited a CAM provider (71). The HUNT study, conducted in Nord-Trønderlag, revealed that in 2008 12.6% of the participants had visited a CAM provider within the last 12 months (67). The reported prevalence was similar, but slightly higher, in a national survey the same year based on 6500 participants, where 16% of the participants reported visit to a CAM provider within the previous 12 months (72).

The prevalence of CAM use in the national follow-up survey, was found to be largest in the 15 to 24 year age group, and the highest general prevalence was found in the eastern part of Norway (50). Although there has been reported an increase in CAM use in Norwegian hospitals between 2000 and 2014 (73, 74), the majority of the CAM users (76%) reported to have consulted CAM outside the public health care system (50).

Despite of the decreasing tendencies in use of CAM providers, the use of CAM still represents a substantial proportion of the Norwegian population's total consumption of health

care. The estimates are also considered relatively high and in accordance with other Scandinavian countries (59). Studies also show that a majority of CAM users report that the treatment have led to an improvement of their health situation (50, 62) or increased their well-being (65, 75). A Norwegian study found that a larger proportion of the healthy part of the population visits CAM providers (67), this suggests that users of CAM is not only looking for relief of illness or cure for disease in their use of CAM. CAM is also used in a large degree to prevent illness and promote well-being (65, 75). Health trends linked to CAM has emerged as a way of taking care of your own body and health (75, 76). In many Western countries, there has been a shift from health being the states responsibility to increasing responsibility of the individual (75). An increasing number of people take part in activities that are considered to have positive effects on body and mind, and health and fitness have come to represent important values for an increasing number of people (75). This development is in accordance with the holistic perspective of many CAM modalities, that highlights the importance of individual responsibility for health (77). As such, many individuals may be attracted to CAM because they hold certain believes that are largely congruent with different CAM modalities (78). Personal orientation towards holistic and spiritual beliefs are also associated with use of CAM, and treating the body well and as a whole then becomes important (65, 78).

1.2.4 Complementary and alternative medicine and alcohol consumption

CAM use is believed to be closely associated with sociodemographic variables such as female gender, age, income, level of education and self-perceived health (56, 65, 71, 79). According to a national survey, close to half of the female participants reported to have used some kind

of CAM, while one out of four male participants reported the same (50). Gender differences in use of CAM has also been found in several recent national (67, 71, 80), and international studies (65, 81).

Although there has been focus on a range of sociodemographic characteristics associated with the use of CAM, only a few studies have examined the relationship between CAM use and alcohol consumption. Previous research have indicated that different level of alcohol consumption is associated with use of different types of CAM therapies (82, 83). Another study found that in general those who engage in positive health behaviours and exhibit fewer health risk factors are more likely to use CAM. The study found an positive association between having consumed alcohol in one's life but not being a heavy drinker and use of CAM (84). Another study found that alcohol consumption was less frequent in those participants that used CAM (85). However, study results have been ambiguous. One study found an inverse relationship between alcohol and CAM (86), while several other studies failed to find any significant association between alcohol consumption and CAM use (87-89).

Different CAM approaches has also been used to treat alcohol-related problems and conditions (90-93). Mindfulness-based interventions, motivational interviewing and muscle relaxation training have shown to be associated with favourable outcomes on problematic drinking, including reduced cravings and motive to drinking for coping purposes (90-93). Disease can for many people be associated with losing control over their own bodies, and patients have reported that the use of CAM is a way of regaining this control (94). Individuals

often drink to change internal states (93). Mindfulness focuses on increasing one's awareness, tolerance and acceptance of internal experiences and may in this way help people cope without drinking (93). Conventional treatment has also shown to have varying effects on alcohol disorders and many individuals relapse after treatment, which might contribute to use of CAM among individuals with drinking problems (93).

Research have shown that people who use CAM are more likely to take a more active role in preventing disease and maintaining their health (65, 83, 95). CAM use have been associated with positive health behaviours and may also encouraged behavioural changes such as increased exercise, smoking cessation and healthier diets (84, 96). Furthermore, health aware behaviour have been found to be associated with both initiation and continuation of CAM use (84, 97). Individuals that exhibit a range of positive health behaviours have also reported to appreciate wellness and the focus on own participation in CAM treatment (78). Based on these findings the hypothesis is that both men and women who use CAM are more likely to drink less alcohol and less likely to partake in harmful use of alcohol.

Due to increasing levels of chronic illness and non-communicable diseases, combined with a stronger demand for individualized care, CAM may play an important role in improving health and well-being (48). Research have indicated that use of CAM may be one possible avenue for changing unfavourable health behaviours (76, 84). In many countries CAM is already widely used in disease prevention and have shown to help relieve financial burden on public health care systems (48). However, because of gaps in knowledge about CAM and

CAM users, its role and effectiveness in many areas remains unclear (58). As such research is needed to explore and better understand the relationship between health-related choices, such as alcohol consumption, and use of CAM. The studies that have looked at the relationship between alcohol consumption and CAM use have been conducted primarily in Germany and the United States where alcohol consumption patterns (2), the use of CAM and associations for CAM use (82, 85) has shown to be different than in Norway (2, 57, 98). Moreover, motives for and prevalence of CAM use, differ according to gender and use of different CAM therapies (50, 71, 79), supporting separate analyses for gender and the different CAM approaches. To our knowledge there has been no research comparing alcohol consumption across different CAM use and non-users in Norway.

1.3 Objective of the thesis

The aim of this study is to describe and compare alcohol consumption and injuries related to alcohol across gender and use of different CAM approaches (alternative practitioner, herbal or "natural" medicine or self-treatment with CAM).

2 Material and methods

2.1 The study population

2.1.1 The Tromsø Study

The Tromsø Study is a population-based, prospective study of a range of health related issues and is considered a great resource for surveillance of risk factors and disease in the population (99). The Tromsø Study consists of seven studies, conducted in Norway in the municipality of Tromsø, from 1974 to 2016 with 6-7 year intervals (100).

The Tromsø Study was initiated in 1974, at a time when the mortality of cardiovascular diseases (CVD) were highly prevalent in Norway, especially in the North (101). The initial aim of the Tromsø Study was to investigate causes of CVD and develop preventive measures for the disease, such as stroke and heart attack (99). Since then, the Tromsø Study have undergone considerable changes, both in terms of design and scope. Increasing emphasis have been put on various chronic diseases, and more extensive cooperation between epidemiology and clinical research has been established (99, 102). The study is run by the UiT The Artic University of Norway (99).

2.1.2 The sixth Tromsø Study

This thesis is based on the sixth Tromsø Study as data from the seventh Tromsø Study was not available when the work with this thesis started. The sixth Tromsø Study was conducted between October 2007 and December 2008. The aim of the study was to get new and updated measurements of the population and thereby assess disease risk factors. The sixth Tromsø

Study is the basis for range of other smaller and more in-depth studies within epidemiology and clinical research (102).

The invited population to the sixth Tromsø Study came from four groups: people who participated in the second visit in the fourth Tromsø study, a ten percent random sample of people aged 30-39, all individuals aged 40-42 or 60-87 and a 40% random sample of subjects aged 43-59 years, all residing in Tromsø municipality (100). An invitation containing information and a four-page questionnaire was sent by mail to the participants within two weeks of a suggested appointment. All participants were invited to come for physical examination (103). A total of 19,762 people between the ages of 30-87 years were invited to participate (102), with a participation rate of 65.7% (12, 981 participants). Participation was lowest in the youngest and oldest age groups and in those who were invited for the first time. For men, the mean age was higher in the participants compared to non-participants, while for women the mean age was slightly lower among participants compared to the non-participant group (99) (Table 1). Attendance were also lower in men compared to women across all age groups and attendees were more likely to be married compared to non-attendees (99, 102).

Table 1: Age comparison between participants and non-participants in the sixth Tromsø Study

The sixth Tromsø Study								
Age group	**Men**				**Women**			
	Participants		Not participants		Participants		Not participants	
30 - 87 years	n (%)	Mean age	n	Mean age	n (%)	Mean age	n	Mean age
	6054 (62.9)	57.5	3571	54.5	6930 (68.4)	57.5	3207	58.1

(99).

Gathering of the data was conducted by questionnaires, interviews, measurements and biological tests. The first questionnaire (Q1), of four pages, included questions on various health issues, symptoms and diseases, use of medication and healthcare services, disability, employment and income, lifestyle, and reproduction (only for women). Q1 was filled out at home and brought to the examination. The second questionnaire (Q2), of 28 pages, was handed out during the examination, and the participant could either fill it out at the spot or return later in prepaid postage envelopes. Q2-data was available for 95.8% of the participants that filled out Q1, and contains follow-up questions of topics covered in Q1 (102). Both questionnaires are displayed in the appendices gathered from the Tromsø Study homepage (100).

Questions of particular interest to this study, includes use of alternative medicine, level of alcohol consumption and other sociodemographic factors.

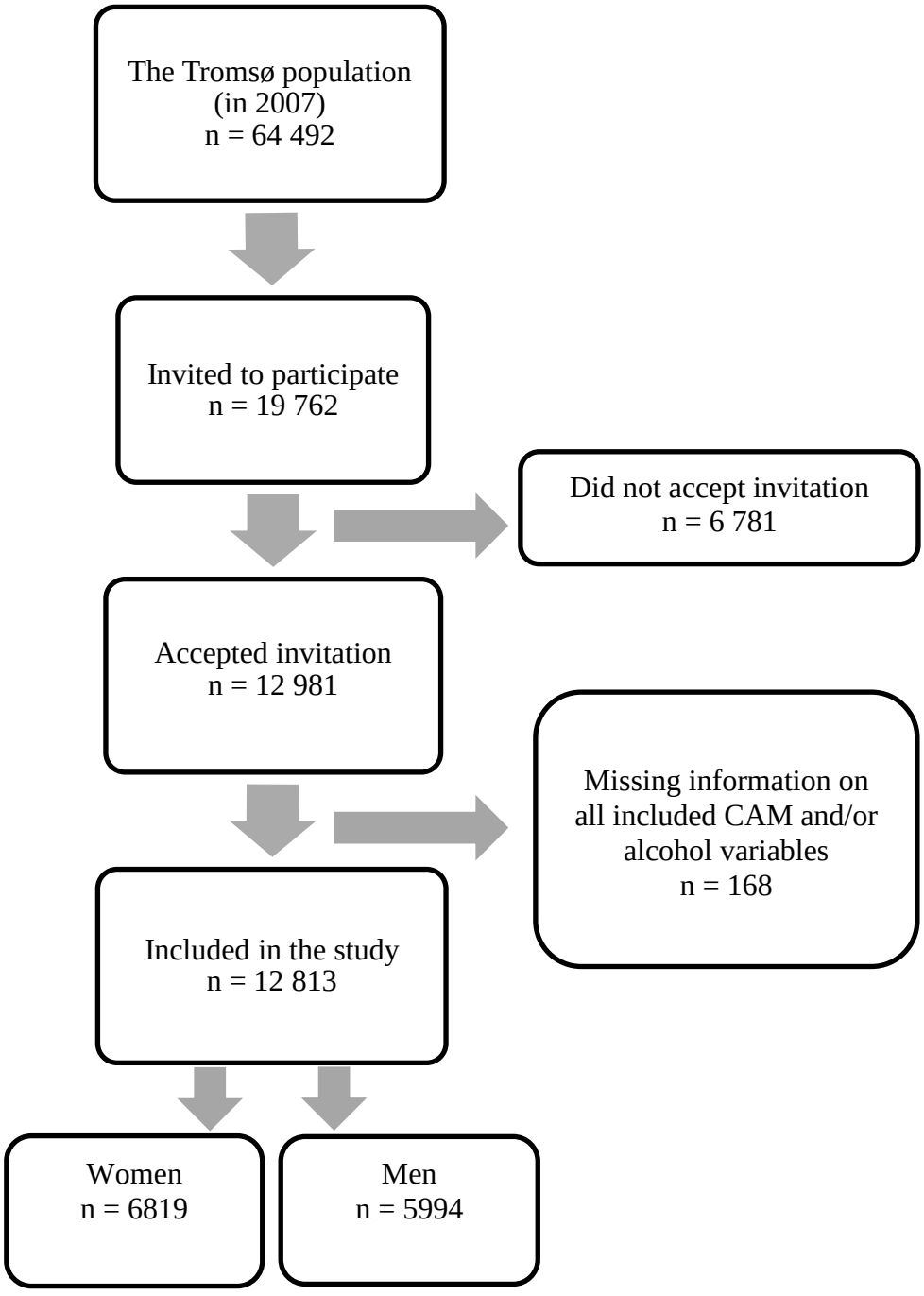
2.1.3 Tromsø

Tromsø is the largest city in north of Norway with about 60 000 people living in the town-center. The municipality with the same name consisted of 74 541 inhabitants January 2017 (104). In 2007, when the sixth Tromsø Study was initiated, the municipality accounted for 64 492 inhabitants (104). The population is increasing and consists mainly of Caucasians of Norwegian descent, but is also home to Sami minority and other ethnic groups (102, 104). The population in Tromsø municipality are on average younger and has a higher level of education compared to the average estimates across Norwegian municipalities, but is similar in regards to parameters such as employment rates, average income per capita, number of physicians per 10,000 residents, proportion of disability pensioners and ratio of urban/rural population (105).

2.1.4 Exclusion and inclusion criteria

Data used in this thesis is obtained from Q1 and Q2 from the sixth Tromsø Study. As shown in Figure 1, were participants who refrained from answering any of the three included CAM questions and/or any of the three included alcohol questions (the included variables are explained in 2.2) excluded from the analyses. This resulted in 109 women and 59 men being excluded from the analyses. A total of 12 813 participants (64.8% of the invited individuals), 6819 women and 5994 men, are included in the current thesis.

Figure 1: Flow chart of the studied population



2.2 Variables used in the analyses

2.2.1 Exposure: Alcohol consumption

Use of alcohol is based on self-reported consumption of alcohol gathered from Q1 and Q2. From Q1, the two following questions about alcohol were included in the analyses. First, "How often do you drink alcohol?" Participant were then asked to tick the suitable of the following five options: "Never", "Monthly or more infrequently", "2-4 times a month", "2-3 times a week", "4 or more times a week". The first category "Never" was used as the reference category for all analyses including alcohol frequency. Secondly, "How many units of alcohol (a beer, a glass of wine or a drink) do you usually drink when you drink alcohol?", with five possible answers: "1-2", "3-4", "5-6", "7-9", "10 or more". The categories with highest level of consumption had few respondents and were collapsed into the category "5 or more". Five or more drinks in one occasion is defined as heavy episodic drinking and have been associated with increased risk of harm (2, 14, 16). The first option, "1-2" units, was set as the reference category whenever this variable was included in the analyses.

From Q2, the following question was included in the analyses: "Have you or someone else been injured because of your drinking?", with "Never", "Yes, but not in the last year" and "Yes, during the last year" as the answering options. Due to few respondents in the two last categories these were merged to one: "Yes". "Never" was set as reference level whenever this alcohol variable was included in the model. This question was chosen because injuries caused by drinking may have huge individual and societal repercussions (1-3). There is also an increasing risk relationship between alcohol and injuries (106), hence, this question could be a

valid measure of unhealthy alcohol consumption levels.

2.2.2 Outcome: Complementary and alternative medicine

In order to get information on the use of CAM, three questions were analysed separately. “Have you during the past year visited: Alternative medical practitioner (homeopath, acupuncturist, foot zone therapist, herbal medical practitioner, laying of hands practitioner, healer, clairvoyant, etc.)”, with the two options, “Yes” or “No”. The participants were also asked: “In the last 12 months have you used meditation, yoga, qi gong or thai chi as self-treatment?” and “In the last 12 months have you used herbal or "natural" medicine?" with “Yes” and “No” as the two possible options. The different CAM variables are not mutually exclusive, as many of CAM users tend to use more than one approach.

2.2.3 Potential confounders

Norwegian research has shown that average alcohol consumption is higher among individuals with higher socioeconomic status, while heavy episodic drinking is more prevalent among Norwegian men from lower social stratums (107, 108). Education have shown to have a U-shaped association with alcohol where those individuals with lowest and highest level of education have the highest consumption (108). Nevertheless, alcohol-related illness and addiction have shown to be more prevalent among groups of lower socioeconomic status (109). A recent national report concludes that older Norwegians tend to drink more frequently than younger age groups, however, total average alcohol consumption was highest in the 16-24 years age group (1). Men tend to drink more often and engage more frequently in heavy

episodic drinking than women (1, 36, 108). When it comes to CAM, studies have shown that CAM users tend to be female, have higher level of education, higher income and poorer self-reported health compared to non-users (49, 56, 65, 71). Studies have been conflicting regarding age differences between user and non-users of CAM (65, 71), however, age is still included as a confounder as it could possibly effect the results. Based on these findings, the main logistic regression models adjusted for following confounders: level of education, household income, age and self-reported health. All included questions are displayed in the questionnaires added in appendix 1 and 2.

Level of education

The participants were asked to state their highest completed level of education from the five following educational groups: "1. Primary, 1-2 years secondary school", "2. Vocational school", "3. High secondary school (A-level)", "4. College/university less than 4 years" and "5. College/university 4 years or more".

Household Income

The participants were asked to state what their total taxable household income was the previous year. Included income from work, social benefits and similar. Originally, the household income variable consisted of eight categories: "Less than 125.000 NOK", "125.000 – 200.000 NOK", "201.000 – 300.000 NOK", "301.000 – 400.000 NOK", "401.000 – 550.000 NOK", "551.000 – 700.000 NOK", "701.000 – 850.000 NOK" and "More than 850.000 NOK". This variable was merged into the four following categories: Low income (<

200.000 NOK), Low middle income (201.000 – 400.000 NOK), High middle income (401.000 – 700.000 NOK), High income (> 701.000 NOK).

Age

The participants age per 31st of December 2007 was recorded. The variable was included as a continuous variable in the main analyses.

Self-reported health

The following question was included to obtain information regarding peoples self-perceived health status: "How do you in general consider your own health to be?" with the options: "Very bad", "Bad", "Neither good nor bad", "Good" and "Excellent". This variable was merged into three categories, where the two first and two last options were merged into two categories.

2.3 Ethical considerations and consent

The sixth Tromsø Study was conducted in 2007/2008 and is approved by the Norwegian Data Protection Authorities (Datatilsynet). The data used lies within existing approvals from the Regional Committee of Medical and Health Research Ethics, North Norway (REK 2009/2536). The participation in the study was voluntary and all the participants has signed an informed consent prior to participation. The Tromsø Study also complies with the Declaration of Helsinki, International Ethical Guidelines for Biomedical Research Involving Human Subjects and the International Guidelines for Ethical Review of Epidemiological Studies (99).

2.4 Statistical methods

The descriptive statistics were preformed using chi-square test. This test explores the relationship between two categorical variables, by comparing the observed frequencies in each category with the expected count if there was no association between the two variables of interest (110). Independent sample t-tests were performed in order to compare mean age between users and non-users of the three different CAM approaches. This test was considered appropriate because it is used when comparing one continuous (age) variable between two different groups (CAM users and non-users).

The main analyses were preformed using binary logistic regression in order to calculate odds ratios (OR) with 95% confidence interval (CI) of having used any of the three different CAM approaches according to alcohol exposure. This analysis was considered appropriate because the dependent variable of interest is dichotomous. Logistic regression also gives a measure for how much each variable impacts the outcome and allows you to test models to predict both continuous and categorical outcomes in the same model. Forced Entry Method was chosen because in this procedure it is possible to assess the predictability of all the predictor variables while at the same time controlling for the effects of the other independent variables (110).

In total nine logistic regression analyses were run, stratified according to gender. Level of education, household income, age and self-reported health were included as independent variables in all the adjusted models.

For the chi-square analyses, none of the cells had an expected count less then 5, thus, this assumption was not violated. For the independent samples t-test the results from the Levene's test for equality of variances was checked and the correct t-values were used accordingly. If the significance value for Levene's test was larger than 0.05 the first line, 'Equal variances assumed', was used. While a significance level of $p \leq 0.05$ tells us that the data violates the assumption of equal variance and the second line in the table, 'Equal variance not assumed', was applied. The assumption of multicollinearity for the logistic regression models, was checked by running linear regression models including the same variables as in the adjusted logistic regression and checking the collinearity diagnostics. None of the variables had a VIF higher than 10 or tolerance values of less than 0.10, indicating that there was no problem of multicollinearity between the variables included in the models.

All the analyses were carried out using the statistical program IBM SPSS, version 24. P-values ≤ 0.05 were considered statistically significant for all conducted analyses.

3 Results

3.1 Characteristics of the studied participants

Basic characteristics of variables used in the main analyses is presented in table 2. The population in this thesis consists of 6819 women and 5994 men, where 53.2% of the participants were women. The average age was 57.4 for men and 57.3 for women, and no statistical significant age difference between men and women was found. A gender difference was however found for education level, household income, self-reported health, alcohol consumption levels and injuries caused by drinking, and use of all three CAM approaches. This suggests that these characteristics are not independent of gender, supporting separate analyses for men and women.

In total 38% of the participant reported having completed education in university/college, where 19.1% of the male participants and 21.5% of the female participants had completed 4 years or more of university/college education. Moreover, 25% of the men and 31.5% of the women reported their highest level of completed education to be primary/secondary school. When questioned about total taxable household income, 7.9% male and 15.7% female participants stated an income of NOK 200.000 or less the previous year. Of the male participants, close to 70% (67.9%) reported having a household income of NOK 401.000 or more, while 55.4% of the women reported the same. Very bad or bad health was reported by 279 (4.7%) men and 407 (6%) women, while 4004 (67.2%) men and 4382 (64.9%) reported having a good or excellent health.

A total of 1413 (11.2%) reported being teetotallers, of which 454 were men and 959 were women. A total of 2481 (41.7%) men reported drinking 2-4 times a month, while 2353 (35%) of the women reported the same. Furthermore, 342 (5.8%) men and 292 (4.3%) women reported drinking 4 or more times per week. 15.6% of the male participants reported consuming 5 or more units of alcohol when drinking, while 4.2% of the female participants reported the same. Among the men, 583 (10.6%) reported having experiences injuries to themselves or others because of their drinking, while 169 (2.8%) of the women reported the same.

A total of 1423 (11.9%) of the participants in this study reported having visited an alternative medical practitioner, 2677 (23%) reported having used herbal or "natural" medicine and 590 (5%) had applied self-treatment techniques within the previous 12 months. Among female participants 995 (15.9%) reported having visited an alternative medical practitioner within the previous year, while 1741 (28.3%) women reported use of herbal or "natural" medicine, and 483 (7.8%) had applied self-treatment techniques. Among the male participants, 428 (7.6%) had visited an alternative medical practitioner, 937 (17.1%) had applied herbal or "natural" medicine, and 107 (1.9%) had utilized self-treatment techniques (Table 2).

Table 2: Basic characteristics of the studied participants

Characteristics of the participants	Total (n = 12813[I])	Men (n = 5994[I])	Women (n = 6819[I])	P-value
Percentage women	53.2			
Age, mean (SD)	57.4 (12.6)	57.4 (12.3)	57.3 (12.9)	0.717[II]
Education, n (%)				
Primary, 1-2 years secondary school	3596 (28.4)	1478 (25.0)	2118 (31.5)	
Vocational school	3298 (26.1)	1670 (28.2)	1628 (24.2)	
High secondary school (A-level)	943 (7.5)	425 (7.2)	518 (7.7)	
College/university less than 4 years	2231 (17.6)	1219 (20.6)	1012 (15.1)	
College/university 4 years or more	2578 (20.4)	1130 (19.1)	1448 (21.5)	<0.000[III]
Household income, n (%)				
Low income (≤ 200.000 NOK)	1417 (11.9)	456 (7.9)	961 (15.7)	
Low middel income (201.000 - 400.000 NOK)	3152 (26.6)	1386 (24.1)	1766 (28.9)	
High middle income (401.000 - 700.000 NOK)	4199 (35.4)	2235 (38.9)	1964 (32.1)	
High income (701.000 NOK or more)	3093 (26.1)	1668 (29.0)	1425 (23.3)	<0.000[III]
Self-reported health, n (%)				
Very bad or bad	686 (5.4)	279 (4.7)	407 (6.0)	
Neither good or bad	3633 (28.6)	1671 (28.1)	1962 (29.1)	
Good or excellent	8386 (66.0)	4004 (67.2)	4382 (64.9)	0.001[III]
Alcohol frequency, n (%)				
Never	1413 (11.2)	454 (7.6)	959 (14.3)	
Monthly or more infrequently	3633 (28.7)	1545 (26.0)	2088 (31.1)	
2-4 times a month	4834 (38.2)	2481 (41.7)	2353 (35.0)	
2-3 times a week	2155 (17.0)	1125 (18.9)	1030 (15.3)	
4 or more times a week	634 (5.0)	342 (5.8)	292 (4.3)	<0.000[III]
Units of alcohol consumed when drinking, n (%)				
1-2 units	7095 (63.3)	2858 (52.3)	4237 (73.8)	
3-4 units	3020 (26.9)	1754 (32.1)	1266 (22.0)	
5 or more units	1091 (9.7)	852 (15.6)	239 (4.2)	<0.000[III]
Injuries because of drinking, n (%)				
Never	10882 (93.5)	4937 (89.4)	5945 (97.2)	
Yes	752 (6.5)	583 (10.6)	169 (2.8)	<0.000[III]
Overall use of CAM modalities, n (%)				
Alternative medical pratitioner[1]	1423 (11.9)	428 (7.6)	995 (15.9)	<0.000[III]
Herbal or 'natural' medicine[2]	2677 (23.0)	937 (17.1)	1740 (28.3)	<0.000[III]
Self-treatment[3]	590 (5.0)	107 (1.9)	483 (7.8)	<0.000[III]

[I] Due to missing responses on the individual questions, not all number will add up to total number of participants.
[II] Independent sample t-test. [III] Pearson Chi-square test.
[1] Answered yes to: Have you during the past year visited: An alternative medical practitioner (homeopath, acupuncturist, foot zone therapist, herbal medicine practitioner, laying on of hands practitioner, healer, clairvoyant etc.)? [2] Answered yes to: In the last 12 months have you used herbal or "natural" medicine? [3] Answered yes to: In the last 12 months have you used meditation, yoga, qi gong or thai chi as self-treatment?

3.2 Main analyses

The unadjusted and adjusted binary logistic regression analyses only showed associations between alcohol consumption and the use of complementary and alternative medicine in some of the models. These associations were primarily found in women.

3.2.1 Visited an alternative medical practitioner

For men, neither the unadjusted nor the adjusted logistic regression analyses showed significant associations between having visited an alternative medical practitioner and any of the three included alcohol consumption variables (table 4A-C). Also for women alcohol frequency and units consumed when drinking fell short of any statistically significant association with the use of an alternative medical practitioner (table 3A, B). However, the analyses did show significant association for women answering yes to "Have you or someone else been injured because of your drinking?". According to the adjusted analyses, those women who had experiences injuries because of their drinking, were 1.69 times (95% CI 1.16 – 2.47) more likely to have applied an alternative medical practitioner compared to those who never had experienced injuries because of drinking (table 3C).

3.2.2 Used herbal or "natural" medicine

For women a significant association was found between the use of herbal or "natural" medicine within the last year and the frequency of alcohol consumption both in the adjusted and unadjusted model. The women drinking alcohol at least 4 times a week were 76% more likely to have used herbal or "natural" medicine (95% CI 1.27 – 2.44) compared to alcohol

abstainers (table 3A). The women who reported drinking 2-4 times a month and 2-3 times a week were 43% (95% CI 1.15 – 1.78) and 37% (95% CI 1.08 – 1.75) respectively, more likely to have used herbal or "natural" medicine compared to teetotallers (table 3A). For women, the adjusted model showed a tendency towards an association between use of herbal or "natural" medicine and injuries caused by drinking, however, not significant (95% CI 0.98 – 1.93) (table 3C).

Also for men, a significant association was found between the use of herbal or "natural" medicine and injuries caused by drinking, in the adjusted model. Men who had experienced injuries to themselves or others as a result of their drinking, had a 31% (95% CI 1.03 – 1.66) higher odds of having applied herbal or "natural" medicine in the previous 12 months (table 4C).

The unadjusted and adjusted analyses found no significant association between the use of herbal or "natural" medicine and the other alcohol consumption patterns, for men (table 4A, B).

3.2.3 Used self-treatment techniques

A significant association was found between use of self-treatment (meditation, yoga, qi gong or thai chi) within the last year and frequency of alcohol consumption for women in the adjusted analysis. The odds of having used such self-treatment techniques were highest among those who drank four times or more per week, with an odds ratio of 2.62 (95% CI 1.48

– 4.61), compared to “Never” drinkers (table 3A). We also found a significant relationship with having used self-treatment techniques and those who reported drinking 2-4 times a month (OR 1.71, 95% CI 1.09 – 2.66) and 2-3 times a week (OR 2.07, 95% CI 1.29 – 3.31), compared to alcohol abstainers (table 3A).

The women who reported to have experiences injuries on themselves or others because of their drinking, were almost twice as likely to have used aforementioned self-treatment techniques (OR=1.95, 95% CI 1.28 – 2.96) according to the adjusted analysis. No significant relationship was found between units of alcohol consumed when drinking and the utilisation of self-treatment techniques for women (table 3B).

Tables 4A-C show that no significant relationship was found between the use of self-treatment techniques and alcohol consumption patterns for men neither in the adjusted nor unadjusted analyses.

Table 3 A-C: Association between alcohol and CAM for female participants

Table A	Alternative practitioner[1]				Herbal medicine[2]				Self-treatment[3]			
	Unadjusted		Adjusted		Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-vaule	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Alcohol Frequency												
Never	1.00		1.00		1.00		1.00		1.00		1.00	
Monthly or more infrequently	0.94 (0.75 - 1.17)	0.570	0.88 (0.68 - 1.14)	0.336	1.13 (0.94 - 1.37)	0.198	1.20 (0.96 - 1.48)	0.105	2.02 (1.32 - 3.09)	0.001	1.46 (0.92 - 2.30)	0.104
2-4 times a month	1.17 (0.94 - 1.45)	0.161	1.08 (0.84 - 1.39)	0.555	1.36 (1.14 - 1.64)	0.001	1.43 (1.15 - 1.78)	0.001	2.86 (1.89 - 4.31)	0.000	1.71 (1.09 - 2.66)	0.019
2-3 times a week	1.04 (0.80 - 1.34)	0.779	1.02 (0.76 - 1.37)	0.885	1.30 (1.05 - 1.61)	0.015	1.37 (1.08 - 1.75)	0.010	3.69 (2.39 - 5.69)	0.000	2.07 (1.29 - 3.31)	0.002
4 or more times a week	1.09 (0.75 - 1.58)	0.649	1.13 (0.75 - 1.71)	0.550	1.60 (1.91 - 2.16)	0.002	1.76 (1.27 - 2.44)	0.001	4.16 (2.46 - 7.03)	0.000	2.62 (1.48 - 4.61)	0.001

Table B	Alternative practitioner[1]				Herbal medicine[2]				Self-treatment[3]			
	Unadjusted		Adjusted		Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-vaule	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Units of alcohol consumed when drinking												
1-2 units	1.00		1.00		1.00		1.00		1.00		1.00	
3-4 units	1.13 (0.95 - 1.35)	0.153	1.03 (0.85 - 1.24)	0.763	1.01 (0.87 - 1.16)	0.918	1.03 (0.89 - 1.21)	0.668	1.12 (0.89 - 1.40)	0.335	0.90 (0.71 - 1.15)	0.395
5 or more units	1.03 (0.72 - 1.48)	0.862	0.79 (0.54 - 1.17)	0.247	0.76 (0.55 - 1.05)	0.092	0.76 (0.54 - 1.07)	0.114	1.05 (0.65 - 1.71)	0.837	0.77 (0.46 - 1.28)	0.316

Table C	Alternative practitioner[1]				Herbal medicine[2]				Self-treatment[3]			
	Unadjusted		Adjusted		Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-vaule	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Injuries because of drinking												
Never	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	1.94 (1.35 - 2.79)	0.000	1.69 (1.16 - 2.47)	0.006	1.45 (1.06 - 2.00)	0.022	1.38 (0.98 - 1.93)	0.059	2.85 (1.91 - 4.24)	0.000	1.95 (1.28 - 2.96)	0.002

[1] Visited an alternative medical practitioner within the previous year. [2] Used herbal or "natural" medicine within the previous year. [3] Used meditation, yoga, qi gong or thai chi as self-treatment within the previous year.

Adjusted p-value, OR and CI are adjusted for health status (cat.), household income (cat.), age (cont) and level of education (cat).

Cat.: categorical; Cont.: continuous

Table 4 A-C: Association between alcohol and CAM for male participants

Table A	Alternative practitioner[1]				Herbal medicine[2]				Self-treatment[3]			
	Unadjusted		Adjusted		Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-vaule	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Alcohol Frequency												
Never	1.00		1.00		1.00		1.00		1.00		1.00	
Monthly or more infrequently	1.10 (0.79 - 1.66)	0.648	0.98 (0.63 - 1.50)	0.911	0.80 (0.60 - 1.06)	0.117	0.84 (0.62 - 1.14)	0.272	0.91 (0.41 - 2.02)	0.818	0.95 (0.40 - 2.23)	0.900
2-4 times a month	1.05 (0.70 - 1.56)	0.807	0.96 (0.63 - 1.45)	0.834	0.81 (0.62 - 1.06)	0.122	0.94 (0.70 - 1.26)	0.686	0.81 (0.38 - 1.75)	0.590	0.73 (0.31 - 1.68)	0.454
2-3 times a week	0.91 (0.59 - 1.40)	0.671	0.86 (0.54 - 1.40)	0.523	0.84 (0.63 - 1.13)	0.260	1.01 (0.73 - 1.38)	0.970	1.33 (0.60 - 2.95)	0.481	1.21 (0.51 - 2.87)	0.670
4 or more times a week	0.82 (0.46 - 1.46)	0.495	0.86 (0.47 - 1.57)	0.627	1.10 (0.76 - 1.58)	0.620	1.19 (0.81 - 1.77)	0.371	1.09 (0.39 - 3.05)	0.865	1.1 (0.36 - 3.17)	0.903

Table B	Alternative practitioner[1]				Herbal medicine[2]				Self-treatment[3]			
	Unadjusted		Adjusted		Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-vaule	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Units of alcohol consumed when drinking												
1-2 units	1.00		1.00		1.00		1.00		1.00		1.00	
3-4 units	1.07 (0.85 - 1.35)	0.560	1.11 (0.87 - 1.41)	0.404	0.88 (0.74 - 1.04)	0.127	0.99 (0.83 - 1.18)	0.880	1.18 (0.76 - 1.83)	0.462	1.12 (0.72 - 1.76)	0.615
5 or more units	1.05 (0.78 - 1.41)	0.732	0.93 (0.67 - 1.28)	0.662	0.86 (0.69 - 1.06)	0.162	1.07 (0.84 - 1.35)	0.590	1.13 (0.64 - 1.99)	0.680	0.85 (0.46 - 1.56)	0.602

Table C	Alternative practitioner[1]				Herbal medicine[2]				Self-treatment[3]			
	Unadjusted		Adjusted		Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-vaule	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Injuries because of drinking												
Never	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	1.08 (0.78 - 1.50)	0.626	0.98 (0.69 - 1.37)	0.890	1.12 (0.89 - 1.40)	0.333	1.31 (1.03 - 1.66)	0.027	1.65 (0.97 - 2.79)	0.064	1.23 (0.72 - 2.12)	0.449

[1] Visited an alternative medical practitioner within the previous year. [2] Used herbal or "natural" medicine within the previous year. [3] Used meditation, yoga, qi gong or thai chi as self-treatment within the previous year.

Adjusted p-value, OR and CI are adjusted for health status (cat.), household income (cat.), age (cont) and level of education (cat).

Cat.: categorical; Cont.: continuous

4 Discussion

4.1 Summary of results

Women

The main analyses revealed that the women who drank alcohol 2 times a month or more frequently were more likely to have applied herbal or "natural" medicine and self-treatment techniques (meditation, yoga, qi gong or thai chi), compared to those who never drank, and those who only drank monthly or more infrequently. The relationship was strongest among women who drank 4 or more times a week. The analyses also found an association between having experienced injuries to themselves or others because of their drinking and use of self-treatment techniques and visit to a CAM practitioner (homeopath, acupuncturist, foot zone therapist, herbal medicine practitioner, laying of hands practitioner, healer, clairvoyant etc.). No significant relationship was found between amount of alcohol consumed when drinking and use of CAM therapies.

Men

For the male participants, the only significant relationship between CAM use and alcohol patterns was found in the adjusted analyses between use of herbal or "natural" medicine and having experiences injuries to themselves or others caused by their own drinking. The analyses showed that those men who had experiences injuries on themselves or others because of their drinking, were 31% more likely to have applied herbal or "natural" medicine.

4.2 Discussion of methodology

The value and use of any study depends on its reliability and validity (111). Reliability refers to the repeatability of the research. In other words, if the study were to be repeated would it then come up with the same results? Reliability is a prerequisite condition for validity, but is not necessarily enough to fulfil it. Validity, in fact, refers to the credibility of the study, and is generally divided into two aspects: internal and external validity. The internal validity is evaluated by looking at how well the study reflects the true situation in the sample being studied (111). In the current thesis, internal validity will be discussed by addressing the use of self-reported data, the statistical methods used and the constructions of variables. External validity refers to how generalizable the results are to the general population. This will be addressed by discussing the selection process and possible systematic differences between participants and non-participants. Naturally, internal validity is an essential condition for external validity, but it does not ensure it.

4.2.1 Strength and limitations

Strengths

The data used in this thesis is gathered from the sixth Tromsø Study. This is a large population study, with a total of 12 981 participants. Considering that the total population of Tromsø municipality constituted about 64 492 inhabitants at the time of the study (104), this is a considerable sample of the target population. In comparison with other similar epidemiological studies, a participation rate of 65.7% is considered high (102). The invitations for the sixth Tromsø Study was based on whole birth cohorts and 20% randomized

groups of people. This randomization of invited participants will help ensure an equal distribution of characteristic of the invited participants. The invitations of whole birth cohorts could ensure that invited participants are not subject to selection bias, thus, provide results that are generalizable in the general population of Tromsø.

In the current cross-sectional study, 168 participants were excluded from the analyses due to inadequate completion of the relevant questions in Q1 and Q2. In spite of this, the study included a large number of participants (n=12 813), 64.8% of the invited participants. The large sample size is a strength in the current study and enables statistical power to show associations even if they are not very strong. The large sample size increases the chance of a more reliable picture of the true situation in population and, thus, increases the accuracy and the external validity of the findings.

Another strength of this study is that it includes information on alcohol frequency, amount and injuries caused by drinking. This allows us to detect a more nuanced picture of alcohol consumption patterns in the current population, instead of recording the average amount consumed. Because the harm of alcohol consumption may depend on consumption patterns (14, 16), this information could be valuable in health research. Further, the questions regarding CAM use, are divided into three different types of CAM modalities, which also allowed us to investigate each of the CAM modalities separate according to alcohol consumption. Our finding show that a different proportion of people reported use of the different modalities and that the association with alcohol consumption was found for some of

the CAM modalities, but not for others.

Limitations

Populations-studies are considered to be an excellent source of data in research (102), nevertheless, the results should be interpreted in light of some limitations. This data reflects a cross-sectional set of associations, meaning that comparisons are made at a single point in time. This study design gives no information on the temporal ordering of possibly causal events (111). We cannot know whether these participants stopped or started drinking/drinking more frequently or if they used CAM first, therefore the direction of causality cannot be directly assessed.

Both strengths and limitations of the design have to be considered when interpreting the results. A longitudinal design might have been preferable because this design could identify possible secular trends in the associations between alcohol and CAM use. Future Tromsø studies could help shed some light on trends and associations between alcohol and CAM use in this population.

Non-response bias

The main concern of non-attendance is non-response bias, due to the possibility that non-attendees might be systematically different from those attending. In the sixth Tromsø Study the participation rate was lowest among people invited for the first time, the youngest and oldest and lower among men compared to women (102). Lowest participation rates were

observed in the oldest participants and youngest men. Higher level of education was also found for the attendees compared to the total population of Tromsø municipality (102). Because CAM use tend to be higher for women than for men and higher for people with higher education (65, 67, 71, 79, 80) this could have led to an overreported use of the three CAM approaches in this thesis, compared to the general population. Thus, led to a wrongful picture of the relationships between CAM modalities and alcohol consumption.

Previous Norwegian studies have revealed that participants tend to be female, healthier and exhibit healthier lifestyles compared to non-attendees (112-114). Therefore, the attendance rate might be lower among heavy drinkers because they have a higher risk of being ill (17, 21). CAM use is also prevalent among critical ill and terminal patients (55, 56), who therefore would be less inclined to participate. Consequently, both alcohol consumption and use of CAM is likely underestimated in this dataset, compared to the target population.

The use of self-reported data

Another well-known source of bias is reporting bias. The data used in this cross-sectional study was collected from two self-administered questionnaires filled out by the study participants. Because self-reported data is not an objective measurement, it relies on the participants giving true answers to the questions asked. The accuracy of the answers might be challenged by several factors such as the participants' perceptions of right and wrong, social pressure, lack of motivation and misinterpretations of the questions (111, 115). Both intentionally and unintentionally, people tend to overestimate their healthy lifestyle choices,

while underestimating unhealthy habits (111). Hence, questions regarding alcohol consumption could be especially prone to report bias (115, 116). Furthermore, drinking levels such as severe intoxication and heavy episodic drinking, might be regarded negatively and associated with a higher social stigma compared to light or moderate consumption (115). Participants with these drinking patterns could therefore be more inclined to underreport their alcohol consumption levels, which could then lead to differential misclassification (111). Furthermore, recalling units of alcohol consumed have proven to be prone to recall bias (116), which could mean that amount consumed is underreported. Bearing this in mind, self-reported measures of alcohol have demonstrated reasonable levels of validity and accuracy (115). Self-report measurements also enables large samples and are non-invasive methods (111).

Due to a small number of cases the answers to the question 'Have you or someone else been injured because of your drinking?' were recoded into "Yes" and "No". Thus, the experience of injuries caused by own drinking was recoded into ever having had such an experience while the question of CAM use was restricted to use within the last 12 months. Having experiences injuries in one's life caused by own drinking, and the use of CAM within the previous 12 months, might therefor not be related simply because people change. Injuries that happened because of drinking, might have happened only once and/or a long time ago and might not be representative for that person's current or general alcohol consumption. This particular question might also be subject to recall bias as participants are challenged to recall an event that perhaps took place a long time ago. The ability to answer accurately and completely, could be difficult when describing drinking behaviour in distant past (115).

Injuries might also occur under severe intoxication, when blackouts are not uncommon (117), and it is likely to be under-reported. Any assumption drawn from this question should be done with caution.

Reduced accuracy due to recall bias might also be present in the CAM variables, as participants were asked to recall use within the last 12 months. Men might also be more prone to underreport use of CAM compared to women, as use of CAM often is associated with femininity and traditional female gender roles as caregiver (81), which could possibly cause some underreporting of CAM among the male participants. Women on the other hand, might be less inclined to report heavy episodic drinking and injuries caused by drinking due to the same traditional gender roles. Heavy episodic drinking and hospital recorded injuries caused by drinking is much more prevalent among men than women in Norway (1, 38), and it is possible that such drinking behaviour is more accepted among men than women, leading more women to underreport such behaviours.

Another possible issue with the CAM variables are the interpretations of the questions. In the question regarding visits to alternative medical practitioner (homeopath, acupuncturist, foot zone therapist, herbal medicine practitioner, laying of hands practitioner, healer, clairvoyant etc.) message is not mentioned as an alternative. In Norway massage is categorized as a CAM treatment (57), however, participants might not be aware of this. This could lead to underreporting of CAM, as massage is by far the most widely used CAM treatment in the country (50, 57, 70).

In the question “In the last 12 months have you used herbal or “natural” medicine?” neither herbal nor “natural” medicine is clarified or explained and is therefore subject to different interpretations. Subgroups in the sample might interpret this differently and thus give a wrongful picture of the true situation in the sample and jeopardize its internal validity. Furthermore, the frequency of CAM use is not included in the current study, thus, differences in alcohol consumption according to level of CAM use is not explored. Frequency of CAM use might have painted a different picture to the associations found between alcohol and CAM use.

Due to the fact that CAM users often apply more than one CAM approach, the different CAM variables are not mutually exclusive in the analyses. The non-users of one approach might still have applied other CAM modalities, thus, not comparing CAM users to non-users. Our focus was to compare users of the different CAM approaches to non-users of these. This provides a more nuances picture of the different CAM approaches and their associations to alcohol consumption patterns. Moreover, excluding those participants who used more than one approach would also result in fewer participants and might have decrease the study’s validity.

4.3 Results in relation to other studies

Previous studies have not showed consistency on whether and to what extent alcohol consumption is associated with use of CAM. One study, conducted in USA, showed that ever drinkers were more likely to have used CAM, compared to lifetime teetotallers. The study

found that among ever drinkers, those who drank infrequently had the highest use of CAM, while heavy drinkers were least likely to have used CAM (84). This is not in accordance with our findings suggesting that those women who drink often were more likely to have used CAM modalities. Another study also found that CAM users reported a lower overall consumption of alcohol, but the article did not report frequency (86), which makes it difficult to compare with the current study. Nevertheless, the findings are in contrast with the findings in this thesis.

A study on cancer patients show that alcohol consumption was less frequent among the ones using CAM compared to non-users, this may be associated with different predictors for CAM use among cancer patients compared to the general population (85).

The studies limited to elderly participants (> 64 years) found no significant association between alcohol consumption and a range of different CAM modalities (88, 89). Alcohol consumption in these studies were also lower than found in the current study, which could be one explanation for the lack of association. Secondly, our results show that people who use CAM on average are younger. The age group included in the sixth Tromsø Study ranges from 30-87 years, and it would be interesting to investigate associations between alcohol consumption and use of CAM in samples with younger participants. According to a recent Norwegian national survey, alcohol consumption among adolescents has decreased the last decade, together with the use of tobacco and illegal substances. Furthermore, adolescents are now increasingly taking part in positive health behaviour, compared to ten years ago (118).

A study from Germany on supplement use showed that women who had a moderate or high level of alcohol intake were more likely to use supplements, compared to women who on average drank less or never, while no such relationship was found for the male participants (83). In the current study supplement use was no separate category, however association was found between moderate to high frequency of alcohol and use of herbal medicine. Although the study might not be directly comparable to this one, it does concur with the gender differences in the association.

The current study also found an association between injuries caused by own drinking and use of self-treatment techniques and visits to alternative medical practitioner (homeopath, acupuncturist, foot zone therapist, herbal medicine practitioner, laying of hands practitioner, healer, clairvoyant etc.), for women. For men, there was found an association between use of herbal or "natural" medicine and injuries to themselves or others because of their own drinking. To the author's knowledge, there has been no other study examining this relationship.

Studies that have investigated the relationship between CAM and alcohol consumption in general are very limited, with information only from a few countries. One of the reasons for the inconsistency in the findings might be that different countries have different CAM use and alcohol consumption patterns (2, 48, 57, 82, 85, 98). Furthermore, only some of the studies conducted gender specific analyses which make comparisons troublesome. Nevertheless, the findings from the current study, is largely in contrast to the other studies that found a lower

level of alcohol consumption among CAM users. Possible explanations of the associations found will be discussed in the following.

4.4 Possible explanations

The hypothesis in this thesis was that people that applied CAM engaged in more positive health behaviours and consequently drank less alcohol and engaged in less harmful use of alcohol. However, the results of this cross-sectional study showed that women who drank and drank frequently were more likely to have used CAM therapies, such as herbal medicine or "natural" medicine and self-treatment techniques. There was not found any association results between amount of alcohol consumed when drinking and use of any of the CAM modalities, for either men nor women. This could mean that women who use self-treatment techniques and herbal medicine drink more frequently, but when doing so they drink small amounts. Several systematic reviews, from different populations, have found associations between moderate alcohol consumption (up to one drink a day for women and up to two for men) and cardioprotective effects (6-8) and decreased risk of type two diabetes (9-11), where the relationship with consumption is J-shaped. The beneficial effect have shown to be stronger for women (17). Other studies, have shown that drinking patterns influence the harm caused by alcohol, where heavy episodic drinking have shown to have more detrimental consequences to a person's health, both in terms of illness and injuries. Cardioprotective effects were found for daily average light to moderate drinkers (9, 14-17). Although possible health benefits associated with moderate alcohol consumption have been highly disputed, drinking often but in small amounts doesn't necessarily suggest low health consciousness.

Nevertheless, our hypothesis that people who use CAM drink less than non-users cannot be confirmed based on these finding.

For both genders, this study found an association between having experiences injuries caused by own drinking and use of CAM, but only with use of herbal medicine for men and use of CAM practitioner and self-treatment techniques for women. Due to the methodological limitations in this question, conclusions about harmful drinking cannot be drawn from this question alone. To our knowledge, this is the first study to address the relationship between injuries cause by drinking and use of CAM and further research is needed in order to explore this relationship. One possible explanation for the association, could be the Norwegian drinking culture that is characterized by heavy episodic drinking during the weekends (1), also causing people without drinking problems to injury themselves or others. The association with herbal or "natural" medicine could be caused by the need for such remedies due to heavy drinking. Hence, the alcohol consumption could affect the use of CAM, not vice versa as hypothesized.

Another hypothesis could be that people who drink to the extent where they end up hurting themselves or others might deliberately change their lifestyle after such an experience and thus become more health aware and to a larger degree apply CAM modalities.

Alcohol different from other health behaviours?

There is little doubt that alcohol consumption causes a large burden on society and individuals. However, it does seem that we have a different relationship towards alcohol compared to other health related behaviours. Studies have found associations between light to moderate alcohol consumption and several positive health behaviours, such as being a non-smoker, regular physical activity, having a healthy weight, and getting influenza vaccinations (119, 120). This could suggest that people who exercise a healthy lifestyle still have a light to moderate alcohol intake. Despite the substantial disease burden caused by alcohol consumption, it is possible that other health-related behaviours could explain a different relationship with use of CAM. A previous study have found that people who engaged in physical activity and individuals of normal weight (84) were more likely to use CAM modalities.

One possible reason for the conflicting results found in this study, compared to other studies, might be that alcohol consumption differs from other health related behaviours in the current population. People from lower social stratum exhibit poorer health behaviours compared to people from higher social stratums in Norway, except when it comes to alcohol consumption. Higher levels of drinking have been especially prevalent for women with higher social status in Norway (109). This could suggest that alcohol is not perceived as a health risk behaviour in the same way as other health-related choices.

When examining the relationship between alcohol and CAM modalities further research could include additional standard health related choices, such as physical activity, smoking, body mass index (BMI) and nutrition (121), and their relation to use of CAM. As additional respondent health behaviours might explain more of the observed relationship in this thesis and paint a clearer picture of the associations between health-related behaviour and CAM. It might also be differences between heavy, moderate and light use of CAM and these nuances are not explored in this thesis.

Gender differences

The results reveal that most of the associations found between CAM modalities and alcohol consumption, was found among the female participants. The only significant association found for men was between use of herbal or "natural" medicine and injuries cause by own drinking. This relationship was, however, not significant for women. The gender differences found are likely due to different associations for use of CAM and different patterns of alcohol consumption for men and women (1, 71, 109, 122). Men often frame their use of CAM in terms of rationality and have reported that their motivation for use of CAM is primarily of disease preventive purposes (122). This might suggest that men that use CAM are more focused on health and more health conscious than the female participants, thus, consequently drinking less alcohol.

Far more men than women suffer injuries caused by drinking compared to women (38), which might explain why the analyses found a significant association here, but not for women.

Drinking to cope?

Another possible explanation is that alcohol use can arise as a mean of coping with or medicating pain or psychiatric problems (90-93, 122) and as such could contribute to explain why we found an association between CAM use and alcohol consumption in women. CAM users have shown to be more likely to report mental disorders such as major depression and panic disorders, compared to non-users (123), and might also drink alcohol to cope with the same issues. Some CAM therapies have been used as strategies to cope with alcohol craving and dependencies (90-93), which also could explain the associations found in the analyses. Injuries caused by drinking and other discomfort caused by heavy drinking could also increase the need for medicine and pain relief, thus increase the use of CAM modalities. This might also be the case for the men, were an association was found between having used herbal or "natural" medicine and experience of injuries to themselves or others caused by own drinking.

External life circumstances might affect both alcohol consumption and use of CAM and could possibly confound the results of the thesis. Partner strain, for instance, have been associated with both increased use of CAM (123) and alcohol (109). Reasons for the increased use of alcohol and CAM and its link to social relationships are beyond the scope of this thesis. However, it is possible that some individuals respond to partner strain or other kinds of mental strain by increased use of CAM as well as increased alcohol consumption. Partner strain might in turn cause them to drink to an extent where they might end up hurting themselves or others. If these factors do affect use of CAM and alcohol use, assessing

physiological data might help further to understand the association found in the current thesis.

Musculoskeletal discomfort and disorders are also widely distributed in the Norwegian population, but it can be difficult to detect based on objective measures (72). Nevertheless, these ailments might impair quality of life and any immediate cure within conventional treatment does not exist (72). This can contribute people with such ailments turning to both alcohol and CAM in search for relief.

Furthermore, in order for us to get a clearer understanding of the associations found between alcohol and CAM use there is a need for longitudinal studies. The information on the relationship is highly limited and comes from cross-sectional studies, which limits the possibility to explore secular trends, exposure and effects. Data from the other Tromsø Studies conducted could help shed some light on causation and thus the reasons for associations found between CAM and alcohol consumption. It would also be interesting to conduct studies where other health behaviours and risk factors were included in the analyses, to get an increased understanding of how CAM and health related behaviours are linked.

5 Conclusion

This thesis cannot fully explain the relationship between alcohol consumption and CAM approaches, however, it could be a piece in a bigger puzzle to describe this relationship. Inconsistency in international findings on associations between alcohol and CAM could indicate that both CAM and alcohol use vary across cultures and over time. The relationship is also likely to be complex, as many factors in life could influence both use of CAM and alcohol consumption. In order to get a clearer picture of the associations between alcohol and CAM use we have to take a closer look at the underlying causes of use of different CAM modalities and alcohol consumption patterns. There is also a need for research with longitudinal design, to explore the causation of the relationship.

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7 Appendices

Appendix 1: The Tromsø Study 2007-2008: Questionnaire 1

Tromsø-undersøkelsen

The form will be read electronically. Please use a blue or black pen
You can not use comas, use upper-case letters.

2007 - 2008 Confidential

HEALTH AND DISEASES

1 **How do you in general consider your own health to be?**

- ☐ Very good
- ☐ Good
- ☐ Neither good nor bad
- ☐ Bad
- ☐ Very bad

2 **How is your health compared to others in your age?**

- ☐ Much better
- ☐ A little better
- ☐ About the same
- ☐ A little worse
- ☐ Much worse

3 **Do you have, or have you had?**

	Yes	No	Age first time
Heart attack	☐	☐	
Angina pectoris	☐	☐	
Stroke/brain hemorrhage	☐	☐	
Atrial fibrillation	☐	☐	
High blood pressure	☐	☐	
Osteoporosis	☐	☐	
Asthma	☐	☐	
Chronic bronchitis/Emphysyma/COPD	☐	☐	
Diabetes mellitus	☐	☐	
Psychological problems *(for which you have sought help)*	☐	☐	
Low metabolism	☐	☐	
Kidney disease, *not including urinary tract infection (UTI)*	☐	☐	
Migraine	☐	☐	

4 **Do you have persistent or constantly recurring pain that has lasted for 3 months or more?**

☐ Yes ☐ No

5 **How often have you suffered from sleeplessness during the last 12 months?**

- ☐ Never, or just a few times
- ☐ 1-3 times a month
- ☐ Approximately once a week
- ☐ More that once a week

6 **Below you find a list of different situations. Have you experienced some of them in the last week (including today)?** (Tick once for each complaint)

	No complaint	Little complaint	Pretty much	Very much
Sudden fear without reason	☐	☐	☐	☐
You felt afraid or worried	☐	☐	☐	☐
Faintness or dizziness	☐	☐	☐	☐
You felt tense or upset	☐	☐	☐	☐
Easily blamed yourself	☐	☐	☐	☐
Sleeping problems	☐	☐	☐	☐
Depressed, sad	☐	☐	☐	☐
You felt useless, worthless	☐	☐	☐	☐
Feeling that life is a struggle	☐	☐	☐	☐
Feeling of hopelessness with regard to the future	☐	☐	☐	☐

USE OF HEALTH SERVICES

7 **Have you during the past year visited:**
If YES; how many times?

	Yes	No	No. of times
General practitioner (GP)	☐	☐	
Psychiatrist/psychologist	☐	☐	
Medical specialist outside hospital *(other than general practitioner/psychiatrist)*	☐	☐	
Physiotherapist	☐	☐	
Chiropractor	☐	☐	
Alternative medical practitioner *(homeopath, acupuncturist, foot zone therapist, herbal medical practitioner, laying on hands practitioner, healer, clairvoyant, etc.)*	☐	☐	
Dentist/dental service	☐	☐	

8 **Have you during the last 12 months been to a hospital?**

	Yes	No	No. of times
Admitted to a hospital	☐	☐	
Had consultation in a hospital without admission;			
At psychiatric out-patient clinic	☐	☐	
At another out-patient clinic	☐	☐	

9 **Have you undergone any surgery during the last 3 years?**

☐ Yes ☐ No

USE OF MEDICINE

10 **Do you take, or have you taken some of the following medications?** (Tick once for each line)

	Never used	Now	Earlier	Age first time
Drugs for high blood pressure	☐	☐	☐	
Lipid lowering drugs	☐	☐	☐	
Drugs for heart disease	☐	☐	☐	
Diuretics	☐	☐	☐	
Medications for osteoporosis	☐	☐	☐	
Insulin	☐	☐	☐	
Tablets for diabetes	☐	☐	☐	
Drugs for metabolism Thyroxine/levaxin	☐	☐	☐	

11 **How often have you during the last 4 weeks used the following medications?** (Tick once for each line)

	Not used the last 4 weeks	Less than every week	Every week, but not daily	Daily
Painkillers on prescription	☐	☐	☐	☐
Painkillers non-prescription	☐	☐	☐	☐
Sleeping pills	☐	☐	☐	☐
Tranquillizers	☐	☐	☐	☐
Antidepressants	☐	☐	☐	☐

12 **State the names of all medications -both those on prescription and non-prescription drugs- you have used regularly during the last 4 weeks.** Do not include vitamins, minerals, herbs, natural remedies, other nutritional supplements, etc.

_____

_____

_____

_____

_____

_____

If the space is not enough for all medications, use an additional paper of your own.

When attending the survey centre you will be asked whether you have used antibiotics or painkillers the last 24 hours. If you have, you will be asked to provide the name of the drug, strength, dose and time of use.

FAMILY AND FRIENDS

13 **Who do you live with?** (Tick for each question and give the number)

	Yes	No	Number
Spouse/cohabitant	☐	☐	
Other persons older than 18 years	☐	☐	
Persons younger than 18 years	☐	☐	

14 **Tick for relatives who have or have had**

	Parents	Children	Siblings
Myocardial infarction	☐	☐	☐
Myocardial infarction before 60 years	☐	☐	☐
Angina pectoris	☐	☐	☐
Stroke/brain haemorrhage	☐	☐	☐
Osteoporosis	☐	☐	☐
Stomach/duodenal ulcer	☐	☐	☐
Asthma	☐	☐	☐
Diabetes mellitus	☐	☐	☐
Dementia	☐	☐	☐
Psychological problems	☐	☐	☐
Drugs/substance abuse	☐	☐	☐

15 **Do you have enough friends who can give you help when you need it?**

☐ Yes ☐ No

16 **Do you have enough friends whom you can talk confidentially with?**

☐ Yes ☐ No

17 **How often do you normally take part in organised gatherings, e.g. sports clubs, political meetings, religious or other associations?**

☐ Never, or just a few times a year
☐ 1-2 times a month
☐ Approximately once a week
☐ More than once a week

WORK, SOCIAL SECURITY AND INCOME

18 **What is the highest level of education you have completed?** (Tick one)

☐ Primary, 1-2 years secondary school
☐ Vocational school
☐ High secondary school (A-level)
☐ College/university less than 4 years
☐ College/university 4 years or more

19 **What is your main occupation/activity?** (Tick one)

☐ Full time work ☐ Housekeeping
☐ Part time work ☐ Retired/benefit recipient
☐ Unemployed ☐ Student/military service

20 **Do you receive any of the following benefits?**

- ☐ Old-age, early retirement or survivor pension
- ☐ Sickness benefit (are in a sick leave)
- ☐ Rehabilitation benefit
- ☐ Full disability pension
- ☐ Partial disability pension
- ☐ Unemployment benefits
- ☐ Transition benefit for single parents
- ☐ Social welfare benefits

21 **What was the households total taxable income last year?** Include income from work, social benefits and similar

- ☐ Less than 125 000 NOK
- ☐ 125 000-200 000 NOK
- ☐ 201 000-300 000 NOK
- ☐ 301 000-400 000 NOK
- ☐ 401 000-550 000 NOK
- ☐ 551 000-700 000 NOK
- ☐ 701 000 -850 000 NOK
- ☐ More than 850 000 NOK

22 **Do you work outdoors at least 25% of the time, or in cold buildings (e.g. storehouse/industry buildings)?**

☐ Yes ☐ No

PHYSICAL ACTIVITY

23 **If you have paid or unpaid work, which statement describes your work best?**

- ☐ Mostly sedentary work *(e.g. office work, mounting)*
- ☐ Work that requires a lot of walking *(e.g. shop assistant, light industrial work, teaching)*
- ☐ Work that requires a lot of walking and lifting *(e.g. postman, nursing, construction)*
- ☐ Heavy manual labour

24 **Describe your exercise and physical exertion in leisure time. If you activity varies much, for example between summer and winter, then give an average. The question refers only to the last year.** (Tick the one that fits best)

- ☐ Reading, watching TV, or other sedentary activity.
- ☐ Walking, cycling, or other forms of exercise at least 4 hours a week *(here including walking or cycling to place of work, Sunday-walking, etc.)*
- ☐ Participation in recreational sports, heavy gardening, etc. *(note:duration of activity at least 4 hours a week)*
- ☐ Participation in hard training or sports competitions, regularly several times a week.

25 **How often do you exercise?** (With exercise we mean for example walking, skiing, swimming or training/sports)

- ☐ Never
- ☐ Less than once a week
- ☐ Once a week
- ☐ 2-3 times a week
- ☐ Approximately every day

26 **How hard do you exercise on average?**

- ☐ Easy- do not become short-winded or sweaty
- ☐ You become short-winded and sweaty
- ☐ Hard- you become exhausted

27 **For how long time do you exercise every time on average?**

☐ Less than 15 minutes ☐ 30-60 minutes
☐ 15-29 minutes ☐ More than 1 hour

ALCOHOL AND TOBACCO

28 **How often do you drink alcohol?**

- ☐ Never
- ☐ Monthly or more infrequently
- ☐ 2-4 times a month
- ☐ 2-3 times a week
- ☐ 4 or more times a week

29 **How many units of alcohol** (a beer, a glass of wine or a drink) **do you usually drink when you drink alcohol?**

☐ 1-2 ☐ 5-6 ☐ 10 or more
☐ 3-4 ☐ 7-9

30 **How often do you drink 6 units of alcohol or more in one occasion?**

- ☐ Never
- ☐ Less frequently than monthly
- ☐ Monthly
- ☐ Weekly
- ☐ Daily or almost daily

31 **Do you smoke sometimes, but not daily?**

☐ Yes ☐ No

32 **Do you/did you smoke daily?**

☐ Yes, now ☐ Yes, previously ☐ Never

33 **If you previously smoked daily, how long is it since you stopped?**

Number of years ☐☐

34 **If you currently smoke, or have smoked before: How many cigarettes do you or did you usually smoke per day?**

Number of cigarettes ☐☐

35 **How old were you when you began smoking daily?**

Number of years ☐☐

36 **How many years in all have you smoked daily?**

Number of years ☐☐

37 **Do you use or have you used snuff or chewing tobacco?**

☐ No, never ☐ Yes, sometimes
☐ Yes, previously ☐ Yes, daily

DIET

38 **Do you usually eat breakfast every day?**

☐ Yes ☐ No

39 **How many units of fruits or vegetables do you eat on average per day?** (units means for example a fruit, a cup of juice, potatoes, vegetables)

Number of units ☐☐

40 **How many times per week do you eat hot dinner?**

Number ☐☐

41 **How often do you usually eat these products?**
(Tick once for each line)

	0-1 times/ mth	2-3 times/ mth	1-3 times/ week	4-6 times/ week	1-2 times/ day
Potatoes	☐	☐	☐	☐	☐
Pasta/rice	☐	☐	☐	☐	☐
Meat *(not processed)*	☐	☐	☐	☐	☐
Processed meat *(sausages/meatloaf/meatballs)*	☐	☐	☐	☐	☐
Fruits, vegetables, berries	☐	☐	☐	☐	☐
Lean fish	☐	☐	☐	☐	☐
Fat fish *(e.g. salmon, trout, mackerel, herring, halibut, redfish)*	☐	☐	☐	☐	☐

42 **How much do you normally drink the following?**
(Tick once for each line)

	Rarely/ never	1-6 glasses /week	1 glass /day	2-3 glasses /day	4 or more glasses /day
Milk, curdled milk, yoghurt	☐	☐	☐	☐	☐
Juice	☐	☐	☐	☐	☐
Soft drinks with sugar	☐	☐	☐	☐	☐

43 **How many cups of coffee and tea do you drink daily?** (Put 0 for the types you do not drink daily)

	Number of cups
Filtered coffee	☐☐
Boiled coffee (coarsely ground coffee for brewing)	☐☐
Other types of coffee	☐☐
Tea	☐☐

44 **How often do you usually eat cod liver and roe?**
(i.e. "mølje")

☐ Rarely/never ☐ 1-3 times/year ☐ 4-6 times/year
☐ 7-12 times/year ☐ More than 12 times/year

45 **Do you use the following supplements?**

	Daily	Sometimes	No
Cod liver oil or fish oil capsules	☐	☐	☐
Omega 3 capsules *(fish oil, seal oil)*	☐	☐	☐
Vitamins and/or mineral supplements	☐	☐	☐

QUESTONS FOR WOMEN

46 **Are you currently pregnant?**

☐ Yes ☐ No ☐ Uncertain

47 **How many children have you given birth to?**

Number ☐☐

48 **If you have given birth, fill in for each child: birth year, birth weight and months of breastfeeding** (Fill in the best you can)

Child	Birth year	Birth weight in grams	Months of breastfeeding
1	☐☐☐☐	☐☐☐☐	☐☐
2	☐☐☐☐	☐☐☐☐	☐☐
3	☐☐☐☐	☐☐☐☐	☐☐
4	☐☐☐☐	☐☐☐☐	☐☐
5	☐☐☐☐	☐☐☐☐	☐☐
6	☐☐☐☐	☐☐☐☐	☐☐

49 **During pregnancy, have you had high blood pressure?**

☐ Yes ☐ No

50 **If yes, which pregnancy?**

☐ The first ☐ Second or later

51 **During pregnancy, have you had proteinuria?**

☐ Yes ☐ No

52 **If yes, which pregnancy?**

☐ The first ☐ Second or later

53 **Were any of your children delivered prematurely (a month or more before the due date) because of preeclampsia?**

☐ Yes ☐ No

54 **If yes, which child?**

1st child ☐ 2nd child ☐ 3rd child ☐ 4th child ☐ 5th child ☐ 6th child ☐

55 **How old were you when you started menstruating?**

Age ☐☐

56 **Do you currently use any prescribed drug influencing the menstruation?**

Oral contraceptives, hormonal IUD or similar ☐ Yes ☐ No

Hormone treatment for menopausal problems ☐ Yes ☐ No

When attending the survey centre you will get a questionnaire about menstruation and possible use of hormones. Write down on a paper the names of all the hormones you have used and bring the paper with you. You will also be asked whether your menstruation have ceased and possibly when and why.

Appendix 2: The Tromsø Study 2007-2008: Questionnaire 2

Tromsø 6

- part of The Tromsø Study

FILL OUT THE FORM IN THIS WAY:

The form would be read by machine, it is therefore important that you tick appropriately:

☒ Correct

☑ Wrong

☒ Wrong

■ If you tick the wrong box, correct by filling the box like this

Write the numbers clearly 1 2 3 4 5 6 7 8 9 0

7 4 Correct

7 4 Wrong

Use only black or blue pen, do not use pencil or felt tip pen

1. DESCRIPTION OF YOUR HEALTH STATUS

Mark the statement that best fits your state of health today by ticking once in one of the boxes under each of the five groups below:

1.01 **Mobility**

- ☐ I have no problems in walking about
- ☐ I have little problems in walking about
- ☐ I am confined to bed

1.02 **Self-care**

- ☐ I have no problems with self-care
- ☐ I have some problems washing or dressing myself
- ☐ I am unable to wash or dress myself

1.03 **Usual activities** (e.g. work, study, housework, family or leisure activities)

- ☐ I have no problems with performing my usual activities
- ☐ I have some problems with performing my usual activities
- ☐ I am unable to perform my usual activities

1.04 **Pain and discomfort**

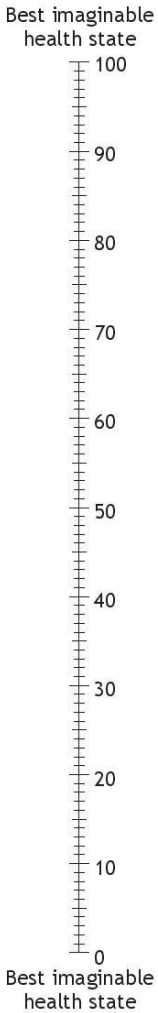
- ☐ I have no pain or discomfort
- ☐ I have moderate pain or discomfort
- ☐ I have extreme pain or discomfort

1.05 **Anxiety and depression**

- ☐ I am not anxious or depressed
- ☐ I am moderately anxious or depressed
- ☐ I am extremely anxious or depressed

1.6 To allow you to show us how good or bad your state of health is we have made a scale (almost like a thermometer) where the best state of health you can imagine is marked 100 and the worst 0. We ask you to show your state of health by drawing a line from the box below to the point on the scale that best fits your state of health.

Your own health state today



2. CHILDHOOD/YOUTH AND AFFILIATION

2.01 **Where did you live at the age of 1 year?**

- ☐ In Tromsø *(with present municipal borders)*
- ☐ In Troms, but not Tromsø
- ☐ In Finnmark
- ☐ In Nordland
- ☐ Another place in Norway
- ☐ Abroad

2.02 **How was your family's financial situation during your childhood?**

- ☐ Very good
- ☐ Good
- ☐ Difficult
- ☐ Very difficult

2.03 **What is the importance of religion in your life?**

- ☐ Very important
- ☐ Somewhat important
- ☐ Not important

2.04 **What do you consider yourself as?** (Tick for one or more alternatives)

- ☐ Norwegian
- ☐ Sami ethnicity
- ☐ Kven/Finnish
- ☐ Another ethnicity

2.05 **How many siblings and children do you have/have you had?**

Number of siblings ..... ☐☐

Number of children ..... ☐☐

2.06 **Is your mother alive?**

☐ Yes ☐ No

If NO: her age when she died ..... ☐☐

Is your father alive?

☐ Yes ☐ No

If NO: his age when he died ..... ☐☐

2.07 **What was/is the highest completed education for your parents and your spouse/cohabitant?** (Tick once for each column)

	Mother	Father	Spouse/ cohabitant
Primary 7-10 years, 1-2 years secondary school	☐	☐	☐
Vocational school	☐	☐	☐
High secondary school (A level)	☐	☐	☐
College or university (less than 4 years)	☐	☐	☐
College or university (4 years or more)	☐	☐	☐

3. WELL BEING AND LIVING CONDITIONS

3.01 **Below are three statements about satisfaction with life as a whole. Then there are two statements about views on your own health. Show how you agree or disagree with each of the statements by ticking in the box for the number you think fits best for you.** (tick once for each statement)

	Completely disagree	1	2	3	4	5	6	7	Completely agree
In most ways my life is close to my ideal		☐	☐	☐	☐	☐	☐	☐	
My life conditions are excellent		☐	☐	☐	☐	☐	☐	☐	
I am satisfied with my life		☐	☐	☐	☐	☐	☐	☐	
I have a positive view of my future health		☐	☐	☐	☐	☐	☐	☐	
By living healthy, I can prevent serious diseases		☐	☐	☐	☐	☐	☐	☐	

3.02 **Below are four statements concerning your current job conditions, or if you are not working now, the last job you had.** (Tick once for each statement)

	Completely disagree	1	2	3	4	5	6	7	Completely agree
My work is tiring, physically or mentally		☐	☐	☐	☐	☐	☐	☐	
I have sufficient influence on when and how my work should be done		☐	☐	☐	☐	☐	☐	☐	
I am being bullied or harassed at work		☐	☐	☐	☐	☐	☐	☐	
I am being treated fairly at work		☐	☐	☐	☐	☐	☐	☐	

3.03 **I consider my occupation to have the following social status in the society**
(if you are not currently employed, think about your latest occupation)

- ☐ Very high status
- ☐ Fairly high status
- ☐ Middle status
- ☐ Fairly low status
- ☐ Very low status

3.04 **Have you over a long period experienced any of the following?** (Tick one or more for each line)

	No	Yes, as a child	Yes, as adult	Yes, last year
Been tormented, or threatened with violence	☐	☐	☐	☐
Been beaten, kicked at or victim of other types of violence	☐	☐	☐	☐
Someone in your close family have used alcohol or drugs in such a way that it has caused you worry	☐	☐	☐	☐

If you have experienced anything of the above, how much are you affected by that now?

☐ Not affected ☐ Affected to some extent ☐ Affected to a large extent

4. ILLNESS AND WORRIES

4.01 **Have you during the last month experienced any illness or injury?**

☐ Yes ☐ No

If YES: have you during the same period? (Tick once for each line)

	Yes	No
Been to a general practitioner	☐	☐
Been to a medical specialist	☐	☐
Been to emergency department	☐	☐
Been admitted to a hospital	☐	☐
Been to an alternative practitioner *(chiropractor, homeopath or similar)*	☐	☐

4.02 **Have you noticed sudden changes in your pulse or heart rythm in the last year?**

☐ Yes ☐ No

4.03 **Do you become breathless in the following situations?** (tick once for each question)

	Yes	No
When you walk rapidly on level ground or up a moderate slope	☐	☐
When you walk calmly on level ground	☐	☐
While you are washing or dressing	☐	☐
At rest	☐	☐

4.04 **Do you cough about daily for some periods of the year?**

☐ Yes ☐ No

If YES: Is the cough usually productive?

☐ Yes ☐ No

Have you had this kind of cough for as long as 3 months in each of the last two years?

☐ Yes ☐ No

4.05 **How often do you suffer from sleeplessness?** (tick once)

☐ Never, or just a few times a year
☐ 1-3 times a month
☐ Approximately once a week
☐ More than once a week

If you suffer from sleeplessness monthly or more often, what time of the year does it affect you most? (Put one or more ticks)

☐ No special time
☐ Polar night time
☐ Midnight sun time
☐ Spring and autumn

4.06 **Have you had difficulty sleeping during the past couple of weeks?**

☐ Not at all
☐ No more than usual
☐ Rather more than usual
☐ Much more than usual

4.07 **Have you during the last two weeks felt unhappy and depressed?**

☐ Not at all
☐ No more than usual
☐ Rather more than usual
☐ Much more than usual

4.08 **Have you during the last two weeks felt unable to cope with your difficulties?**

☐ Not at all
☐ No more than usual
☐ Rather more than usual
☐ Much more than usual

4.09 **Below, please answer a few questions about your memory**: (tick once for each question)

	Yes	No
Do you think that your memory has declined?	☐	☐
Do you often forget where you have placed your things?	☐	☐
Do you have difficulties finding common words in a conversation?	☐	☐
Have you problems performing daily tasks you used to master?	☐	☐
Have you been examined for memory problems?	☐	☐

If YES to at least one of the first four questions above: Is this a problem in your daily life?

☐ Yes ☐ No

4.10 **Have you during the last last year suffered from pain and/or stiffness in muscles or joints in your neck/shoulders lasting for at least 3 consecutive months?**
(tick once for each line)

	No	A little	A lot
Neck, shoulder	☐	☐	☐
Arms, hands	☐	☐	☐
Upper part of the back	☐	☐	☐
The lumbar region	☐	☐	☐
Hips, leg, feet	☐	☐	☐
Other places	☐	☐	☐

4.11 **Have you suffered from pain and/or stiffness in muscles or joints during the last 4 weeks**

	No	A little	A lot
Neck, shoulder	☐	☐	☐
Arms, hands	☐	☐	☐
Upper part of the back	☐	☐	☐
The lumbar region	☐	☐	☐
Hips, leg, feet	☐	☐	☐
Other places	☐	☐	☐

4.12 **Have you ever had:**

	Yes	No	Age last time
Fracture in the wrist/underarm?	☐	☐	☐☐
Hip fracture?	☐	☐	☐☐

4.13 **Have you been diagnosed with arthrosis by a doctor?**
☐ Yes ☐ No

4.14 **Do you have or have you ever had some of the following:**

	Never	Little	Much
Nickel allergy	☐	☐	☐
Pollen allergy	☐	☐	☐
Other allergies	☐	☐	☐

4.15 **Have you ever experienced infertility for more than 1 year?**
☐ Yes ☐ No

If Yes: was it due to:

	Yes	No	Do not know
A condition concerning you?	☐	☐	☐
A condition concerning your partner?	☐	☐	☐

4.16 **To which degree have you had the following complaints during the last 12 months?**

	Never	Little	Much
Nausea	☐	☐	☐
Heartburn/regurgitation	☐	☐	☐
Diarrhoea	☐	☐	☐
Constipation	☐	☐	☐
Alternating diarrhoea and constipation	☐	☐	☐
Bloated stomach	☐	☐	☐
Abdominal pain	☐	☐	☐

4.17 **If you have had abdominal pain or discomfort during the last year:**

	Yes	No
Was it located in your upper stomach?	☐	☐
Were you bothered as often as once a week or more during the last 3 months?	☐	☐
Became better after bowel movement?	☐	☐
Are the symptoms related to more frequent or rare bowel movements than normally?	☐	☐
Are the symptoms related to more loose or hard stool than normally?	☐	☐
Do the symptoms appear after a meal?	☐	☐

4.18 **Have you ever had:**

	Yes	No	Age last time
Stomach ulcer	☐	☐	☐☐
Duodenal ulcer	☐	☐	☐☐
Ulcer surgery	☐	☐	☐☐

4.19 **For women: Have you ever had a miscarriage?**
☐ Yes ☐ No ☐ Do not know
If Yes: number of times ☐☐

4.20 **For men: Have your partner ever had a miscarriage?**
☐ Yes ☐ No ☐ Do not know
If Yes: number of times ☐☐

4.21 **Is your diet gluten-free?**
☐ Yes ☐ No ☐ Do not know

4.22 **Have you been diagnosed with Dermatitis Herpetiformis (DH)?**
☐ Yes ☐ No ☐ Do not know

4.23 **Have you been diagnosed with coeliac disease, based on a biopsy from your intestine taken in an endoscopy examination?**
☐ Yes ☐ No ☐ Do not know

4.24 **Do you have your natural teeth?**
☐ Yes ☐ No

4.25 **How many amalgam tooth fillings do you have/have you had?**
☐ 0 ☐ 1-5 ☐ 6-10 ☐ 10+

4.26 **Have you been suffering from headache <u>the last year</u>?**
☐ Yes ☐ No

If No: go to section 5, food habits

4.27 **What kind of headache are you suffering from?**
☐ Migraine ☐ Other headache

4.28 **How many days <u>per month</u> do you suffer from headache?**
☐ Less than one day
☐ 1-6 days
☐ 7-14 days
☐ More than 14 days

4.29 **Is the headache usually:**
(tick one for each line)

	Yes	No
Pounding/pulsatory pain	☐	☐
Pressing/tightening pain	☐	☐
Unilateral pain *(right or left)*	☐	☐

4.30 **What is the intensity of your headache?**
☐ Mild *(do not hinder normal activity)*
☐ Moderate *(decrease normal activity)*
☐ Strong *(block normal activity)*

4.31 **What is the duration of the headache usually?**
☐ Less than 4 hours
☐ 4 hours - 1 day
☐ 1-3 days
☐ More than 3 days

4.32 **If you suffer from headache, when during the year does it affect you most?** (tick one or more)
☐ No special time
☐ Polar night time
☐ Midnight sun time
☐ Spring and/or Autumn

4.33 **Before or during the headache, do you have a transient:**

	Yes	No
Visual disturbances? *(flickering, blurred vision, flashes of light)*	☐	☐
Unilateral numbness in your face or hand?	☐	☐
Deterioration by moderate physical Activity?	☐	☐
Nausea and/or vomiting?	☐	☐

4.34 **Describe how many days you have been away from work or school during the <u>last month</u> due to headache?**
Number of days ☐☐

5. FOOD HABITS

5.01 **How often do you usually eat the following?** (tick once for each line)

	0-1 times per month	2-3 times per month	1-3 times per week	More than 3 times per week
Fresh water fish *(not farmed)*	☐	☐	☐	☐
Salt water fish *(not farmed)*	☐	☐	☐	☐
Farmed fish *(salmon, trout, char)*	☐	☐	☐	☐
Tuna fish *(fresh or canned)*	☐	☐	☐	☐
Fish bread spread	☐	☐	☐	☐
Mussels, shells	☐	☐	☐	☐
The brown content in crabs	☐	☐	☐	☐
Whale or seal meat	☐	☐	☐	☐
Pluck (liver/kidney/heart) from reindeer or elk/moose	☐	☐	☐	☐
Pluck (liver/kidney/heart) from ptarmigan/grouse	☐	☐	☐	☐

5.02 **How many time during the year do/did you usually eat the following?** (number of times)

	In adulthood	In childhood
Mølje (cod or pollack meat, liver, and roe) *(Number of times per year)*	|	|
Gulls egg *(Number of eggs per year)*	|	|
Reindeer meat *(Number of times per year)*	|	|
Local mushroom and wild berries *(blueberries/lingonberries/cloudberries) (Number of times per year)*	||	||

5.03 **How many times per month do you eat canned (tinned) foods (from metal boxes)?**

Number ☐

5.04 **Do you take vitamins and/or mineral supplements?**

☐ Yes, daily ☐ Sometimes ☐ Never

5.05 **How often do you eat?**

	Never	1-3 times per month	1-3 times per week	4-6 times per week	1-2 times per day	3 times per day or more
Dark chocolate	☐	☐	☐	☐	☐	☐
Light chocolate/milk chocolate	☐	☐	☐	☐	☐	☐
Chocolate cake	☐	☐	☐	☐	☐	☐
Other sweets	☐	☐	☐	☐	☐	☐

5.06 **If you eat chocolate, how much do you usually eat each time?**
Compared with the size of a Kvikk-Lunsj sjokolade *(a chocolate brand in the market)* and describe how much do you eat in relation to it.

¼	½	1	1 ½	2	More than 2
☐	☐	☐	☐	☐	☐

5.07 **How often do you drink cocoa/hot chocolate?**

Never	1-3 times per month	1-3 times per week	4-6 times per week	1-2 times per day	3 times per day or more
☐	☐	☐	☐	☐	☐

6. ALCOHOL

6.01 **How often have you in the last year:**	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
Not been able to stop drinking alcohol when you have started?	☐	☐	☐	☐	☐
Failed to do what was normally expected of you because of drinking?	☐	☐	☐	☐	☐
Needed a drink in the morning to get yourself going after a heavy drinking session?	☐	☐	☐	☐	☐
Had feeling of guilt or remorse after drinking?	☐	☐	☐	☐	☐
Not been unable to remember what happened the night before because of your drinking?	☐	☐	☐	☐	☐

	Never	Yes, but not in the last year	Yes, during the last year
6.02 **Have you or someone else been injured because of your Drinking?**	☐	☐	☐
Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	☐	☐	☐

7. WEIGHT

7.01 **Have you involuntary lost weight during the last 6 months?**

☐ Yes ☐ No

If Yes: how many kilograms? ..... |__|

7.02 **Estimate your body weight when you were 25 years old:**

Number of kilograms ..... |__|__|

7.03 **Are you satisfied with your present body weight?**

☐ Yes ☐ No

7.04 **What weight would you be satisfied with (your "ideal" weight)?**

Number of kilograms ..... |__|__|

8. SOLVENTS

8.01 **How many hours per week, do you do the following leisure- or professional activities:**

Automobile repair/paint, ceramic work, painting/solvents, hair dressing, glazier, electrician. (Put 0 if you do not engage in such leisure or professional activities)

Number of hours per week on average |__|

8.02 **Do you use hair color preparations**

☐ Yes ☐ No

If Yes: How many times per year? .. |__|

9. USE OF HEALTH SERVICES

9.01 **Have you ever experienced that disease has been inadequately examined or treated, and that this had serious consequences?**

- ☐ Yes, this has happened to me
- ☐ Yes, this has happened to a close relative *(child, parents, spouse)*
- ☐ No

If Yes, where do you think the reason of the problem is? (tick once or more):

- ☐ With a general practitioner
- ☐ With an emergency medical doctor
- ☐ With a private practising specialist
- ☐ With a hospital doctor
- ☐ With another health personnel
- ☐ With an alternative practitioner
- ☐ with more than one person due to the failure of procedures and collaboration

9.02 **Have you ever felt persuaded to accept an examination or treatment that you do not want?**

☐ Yes ☐ No

If Yes, do you think this has had unfortunate health-related consequences?

☐ Yes ☐ No

9.03 **Have you ever complained about a treatment you have got?**

- ☐ Have never a reason for complaining
- ☐ Have considered complaining, but did not do that
- ☐ Have complained verbally
- ☐ Have complained in writing

9.04 **How long have you had your current general practitioner/other physician?**

- ☐ Less than 6 months
- ☐ 6 to 12 months
- ☐ 12 to 24 months
- ☐ More than 2 years

9.05 **At the last visit to the general practitioner, did the doctor(s) speak to you in a way so you understand them?** Answers to a scale from 0 to 10, where 0 = they were difficult to understand and 10 = they were always easy to understand

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

9.06 **How would you characterize the treatment or counselling, you got the last time you were with a doctor?** Answer on a scale from 0 to 10, where 0 = very bad treatment, and 10 = very good treatment

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

9.07 **Do you have during the last 12 months experienced that it has been difficult to be referred to special investigations (like X-ray or similar) or to specialized health service (private practising specialist or at hospital)?**

- ☐ Not applicable
- ☐ No problem
- ☐ Some problems
- ☐ Great problems

9.08 **Have you during the last 12 months experienced that it is difficult to be referred to physiotherapist, chiropractor or similar?**

- ☐ Not applicable
- ☐ No problem
- ☐ Some problems
- ☐ Great problems

9.09 **All in all, have you experienced that it is difficult or simply to be referred to specialized health services?**

- ☐ Not applicable
- ☐ Very difficult
- ☐ Somehow difficult
- ☐ Reasonably easy
- ☐ Very easy

9.10 **Have you during the last 12 months been to examination or treatment in specialized health service?**

☐ Yes ☐ No

If Yes, did the doctor(s) speak to you so that you understood them? Answer on a scale from 0 to 10, where 0 = they were difficult to understand and 10 = they were always easy to understand

0 1 2 3 4 5 6 7 8 9 10

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

9.11 **How would you characterize the treatment or advice you got last time you were with a specialist?** Answer on a scale from 0 to 10, where 0 = very poor and 10 = very good

0 1 2 3 4 5 6 7 8 9 10

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

9.12 **Have you ever before 2002 undergone an operation in hospital or specialist clinic?**

☐ Yes ☐ No

9.13 **Have you during the last 12 months used herbal medicine, natural means or natural medicines?**

☐ Yes ☐ No

9.14 **Have you during the last 12 months used meditation, yoga, qi gong or thai chi as own treatment?**

☐ Yes ☐ No

10. USE OF ANTIBIOTICS

10.01 **Have you used antibiotics during the last 12 months?** (all penicillin-like medicine in the form of tablets, syrups or injections)

☐ Yes ☐ No ☐ Do not remember

If YES: What did you get the treatment for? Have you taken many antibiotic treatments, tick for each treatment.

	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
• Urinary tract infection *(bladder infection, cystitis)*	☐	☐	☐	☐	☐	☐
• Respiratory tract infection *(ear, sinus, throat or lung infection, bronchitis)*	☐	☐	☐	☐	☐	☐
• Other	☐	☐	☐	☐	☐	☐
Treatment duration: number of days	| |	| |	| |	| |	| |	| |

How did you acquire the antibiotics for treatment? Have you acquired many treatments, tick for each one.

	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6
With prescription from a doctor/dentist	☐	☐	☐	☐	☐	☐
Without contacting a doctor/without prescription:						
· Purchase from a pharmacy abroad	☐	☐	☐	☐	☐	☐
· Purchase over the internet	☐	☐	☐	☐	☐	☐
· Remnants from earlier treatment at home	☐	☐	☐	☐	☐	☐
· From family/friends	☐	☐	☐	☐	☐	☐
· Other ways	☐	☐	☐	☐	☐	☐

10.02 **Do you have antibiotics at home?**

☐ Yes ☐ No

If YES:is this after an agreement with your doctor for treatment of chronic or frequently recurring disease?

☐ Yes ☐ No

If No: how did you acquire this antibiotic? (Multiple ticks are possible)

- Purchased from a pharmacy abroad ☐
- Purchased over the internet ☐
- Remnants from earlier treatment ☐
- From family/friends ☐
- Other ways ☐

10.03 **Would you consider using antibiotics without consulting your doctor?**

☐ Yes ☐ No

If YES: which conditions would you treat in such situation? (multiple ticks are possible)

- Common cold ☐
- Cough ☐
- Bronchitis ☐
- Sore throat ☐
- Sinusitis ☐
- Fever ☐
- Influenza ☐
- Ear infection ☐
- Diarrhoea ☐
- Urinary tract infection ☐
- Other infections ☐

11. YOUR CIRCADIAN RHYTHM

We will ask you some questions about your sleeping habits

11.01 **Have you worked in a shift work schedule during the last 3 months?**

☐ Yes ☐ No

11.02 **Number of days per week which you <u>cannot</u> freely choose when you sleep (e.g. work days)?**

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

Then I go to bed at ..... ☐☐:☐☐

I get ready to fall asleep at ..... ☐☐:☐☐

Number of minutes I need to fall asleep ..... ☐☐

I wake up at ..... ☐☐:☐☐

With help of: ☐ Alarm clock ☐ External stimulus *(noise, family members etc.)* ☐ By myself

Number of minutes I need to get up ..... ☐☐

11.03 **Number of days per week which you <u>can</u> freely choose when you sleep** (e.g. free days or holidays)

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

Then I go to bed at ..... ☐☐:☐☐

I get ready to fall asleep at ..... ☐☐:☐☐

Number of minutes I need to fall asleep ..... ☐☐

I wake up at ..... ☐☐:☐☐

With help of: ☐ Alarm clock ☐ External stimulus *(noise, family members etc.)* ☐ By myself

Number of minutes I need to get up ..... ☐☐

12. SKIN AND DERMATOLOGY

12.01 **How often do you usually take a shower or a bath?** (tick once)

- ☐ 2 or more times daily
- ☐ 1 time daily
- ☐ 4-6 times per week
- ☐ 2-3 times per week
- ☐ Once a week
- ☐ Less than once a week

12.02 **How often do you during a day usually wash your hands with soap?** (tick once)

- ☐ 0 times
- ☐ 1-5 times
- ☐ 6-10 times
- ☐ 11-20 times
- ☐ More than 20 times

12.03 **Have you ever taken any antibiotics (penicillin and similar medicines) because of a skin disease, for example infected eczema, acne, non-healing leg ulcers, recurrent abscess?**

☐ Yes ☐ No

If Yes: How many times in average per year did you take antibiotics during the period you were most affected (tick once)

☐ 1-2 ☐ 3-4 ☐ More than 4 times

12.04 **Have you or have you ever had the following skin disorders?** (tick once for each line)

	Yes	No
Psoriasis	☐	☐
Atopic eczema (children's eczema)	☐	☐
Recurrent hand eczema	☐	☐
Recurrent pimples/spots for several months	☐	☐
Leg or foot ulcer that did not heal for 3-4 weeks	☐	☐

If Yes for the question on leg and/or foot ulcer, do you have the ulcer today?

☐ Yes ☐ No

12.05 **Have you often or always any of the following complaints?** (tick once for each line)

	Yes	No
Swelling in the ankles or legs, particularly in the evenings	☐	☐
Varicose veins	☐	☐
Eczema (red, itchy rash) on your legs	☐	☐
Leg pain when you walk, but is relieved when you stand still	☐	☐

12.06 **Have you ever had the following diagnoses by a physician?** (tick once for each line)

	Yes	No
Psoriasis	☐	☐
Atopic eczema	☐	☐
Rosacea	☐	☐

12.07 **Have you recurring large acne/abscesses that are tender/painful and often form scars in the following places?** (tick once for each line)

	Yes	No
Armpits	☐	☐
Under the breasts	☐	☐
Stomach groove/the navel	☐	☐
Around the genitalia	☐	☐
Around the anus	☐	☐
The groin	☐	☐

If Yes: Have you ever visited a physician because of abscesses?

☐ Yes ☐ No

If Yes, did you get any of the following treatments? (tick once for each line)

	Yes	No
Antibiotic ointment	☐	☐
Antibiotic tablets	☐	☐
Surgical drainage	☐	☐
A larger surgical intervention including skin removal	☐	☐
Surgical laser treatment	☐	☐

Follow-up questions

INFORMATION TO FOLLOW-UP QUESTIONS

The following pages with questions should not be answered by all. If you have answered yes to one or more of questions below, we ask you to move on to the follow-up questions on the topic or topics you have answered yes to. The first four topics are from the first questionnaire and the last question is from this form.

We have for the sake of simplicity highlighted topics with different colors so that you will find the questions that applies to you.

If you answered YES to that you have: long-term or recurrent pain that has lasted for 3 months or more, please answer the questions on page 19 and 20. The margin is marked with green.

If you answered YES to that you have undergone any surgery during the last 3 years, please answer the questions on page 21 and 22. The margin is marked with purple.

If you answered YES to that you're working outdoors at least 25% of the time, or in facilities with low temperature, such as warehouse/industrial halls, please answer the questions on page 23 The margin is marked with red.

If you answered YES to that you have used non-prescription pain relievers, please answer questions on page 24. The margin is marked with orange.

If you answered YES to that you have or have ever had skin problems (such as psoriasis, atopic eczema, non-healing leg or foot ulcerl, recurrent hand eczema, acne or abscesses), please answer the questions on page 25. The margin is marked with yellow.

If you have answered **NO** to these five questions, you are finished with your answers. The questionnaire is to be ~~ret~~urned in the reply envelope you were given at the survey. The postage is already paid.

Should you wish to give us written feedback on either the questionnaire or The Tromsø Survey in general, you are welcome to that on page 26.

Do you have any questions, please contact us by phone or by e-mail. You can find the contact information on the back of the form. **THANK YOU** for taking the time to the survey and to answer our questions.

13. FOLLOW-UP QUESTIONS ON PAIN

You answered in the first questionnaire that you have protracted or constantly recurrent pain that has lasted for 3 months or more. Here, we ask you to describe the pain a little closer.

13.01 **How long have you had this pain?**

Number of years ☐☐ months ☐☐

13.02 **How often do you have this pain?**

- ☐ Every day
- ☐ Once a week or more
- ☐ Once a month or more
- ☐ Less than once a month

13.03 **Where does it hurt?** (Tick for all locations where you have protracted or constantly recurrent pain)

- ☐ Head/face
- ☐ Jaw/temporo-mandibular joint
- ☐ Neck
- ☐ Back
- ☐ Shoulder
- ☐ Arm/elbow
- ☐ Hand
- ☐ Hip
- ☐ Thigh/knee/leg
- ☐ Ankle/foot
- ☐ Chest/breast
- ☐ Stomach
- ☐ Genitalia /reproductive organs
- ☐ Skin
- ☐ Other locations

13.04 **What do you believe is the cause of the pain?** (Tick for all known causes)

- ☐ Accident /acute injury
- ☐ Long-term stress
- ☐ Surgical intervention/operation
- ☐ Herniated disk *(prolapse)* /lumbago
- ☐ Whiplash
- ☐ Migraine/headache
- ☐ Osteoarthritis
- ☐ Rheumatoid arthritis
- ☐ Bechterews syndrome
- ☐ Fibromyalgia
- ☐ Angina pectoris
- ☐ Poor blood circulation
- ☐ Cancer
- ☐ Nerve damage/neuropathy
- ☐ Infection
- ☐ Herpes zoster
- ☐ Another cause *(describe below)*
- ☐ Don't know

Describe the other cause:

.....

13.05 **Which kind of treatment have you received for the pain?** (Tick for all types of pain treatments you have received)

- ☐ No treatment
- ☐ Analgesic medications
- ☐ Physiotherapy/chiropractic treatment
- ☐ Treatment at a pain clinic
- ☐ Surgery
- ☐ Psycho-educative/relaxation training/ psychotherapy
- ☐ Acupuncture
- ☐ Complimentary medicine *(homeopathy, healing, aromatherapy, etc.*
- ☐ Another treatment

13.06 **On a scale of 0 to 10, where 0 corresponds to no pain and 10 corresponds to the worst possible pain you can imagine:**

How strong would you say that the pain usually is?	No pain	0	1	2	3	4	5	6	7	8	9	10	Worst imaginable pain
How strong is the pain when it is in its strongest intense?	No pain	0	1	2	3	4	5	6	7	8	9	10	Worst imaginable pain
To what degree does the pain interfere with your sleep?	No effect	0	1	2	3	4	5	6	7	8	9	10	Impossible to sleep
To what degree does the pain interfere with performing common activities at home and at work?	No effect	0	1	2	3	4	5	6	7	8	9	10	Can not do anything

14. FOLLOW-UP QUESTIONS ON SURGERY

In the first questionnaire you answered that you have undergone an operation during the last 3 years.

14.01 **How many times have you undergone surgery during the last 3 years?**

Number ..... ☐

Below, please describe the operation. If you have undergone several operations during the last 3 years, these questions concern the last surgery you underwent.

14.02 **Where in your body did you have surgery?**
(If you were operated simultaneously in several places in the body, tick more than once)

Surgery in the head/neck/back
- Head/face ☐
- Neck/throat ☐
- Back ☐

Surgery in the chest
- Heart ☐
- Lungs ☐
- Breasts ☐
- Another surgery in the chest region ☐

Surgery in the stomach/pelvis
- Stomach/intestines ☐
- Inguinal hernia ☐
- Urinary tract/reproductive organs ☐
- Gall bladder/biliary tract ☐
- Another surgery in the stomach/pelvis ☐

Surgery in the hip/legs
- Hip/thigh ☐
- Knee/leg ☐
- Ankle/foot ☐
- Amputation ☐

Surgery in the shoulder and arm
- Shoulder/overarm ☐
- Elbow/underarm ☐
- Hand ☐
- Amputation ☐

14.03 **Reason for the surgery:**
- Acute illness/trauma ☐
- Planned non-cosmetic operation ☐
- Planned cosmetic operation ☐

14.04 **Where did you have the surgery?**
- Tromsø hospital ☐
- Harstad hospital ☐
- Other public hospital ☐
- Private clinic ☐

14.05 **How long time is it since you had surgery?**

Number of years ..... ☐ Months ..... ☐

14.06 **Do you have reduced sensitivity in an area near the surgical scar?**

☐ Yes ☐ No

14.07 **Are you hypersensitive to touch, heat or cold in an area near the surgical scar?**

☐ Yes ☐ No

14.08 **Does slight touch from clothes, showering or similar cause discomfort/pain?**

☐ Yes ☐ No

14.09 **If you had pain at the site of surgery before you had surgery, do you have the same type of pain now?**

☐ Yes ☐ No

14.10 **The pain at the site of surgery**: Answer on a scale from 0 to 10, where 0=no pain and 10=worst pain you can imagine

How strong pain did you have at the site of surgery <u>before</u> you had surgery	No pain	0	1	2	3	4	5	6	7	8	9	10	Worst imaginable pain
How strong pain do you normally have at the site of surgery <u>now</u>	No pain	0	1	2	3	4	5	6	7	8	9	10	Worst imaginable pain
How strong pain do you normally have at the site of surgery when it is most intense	No pain	0	1	2	3	4	5	6	7	8	9	10	Worst imaginable pain

15. FOLLOW-UP QUESTIONS ABOUT WORK IN COLD ENVIRONMENT

In the first questionnaire you answered yes to that you work in cold environments. Here are some follow-up questions that we hope you will answer.

15.01 **Do you feel cold at work?**

- ☐ Yes, often
- ☐ Yes, sometimes
- ☐ No, never

15.02 **For how long have you been exposed to cold air below 0°C during the last winter?**

Leisure/hobbies *(hours/week)* ..... |_|

Work *(hours/week)* ..... |_|

Outdoors, with suitable clothing *(hours/week)* ..... |_|

Outdoors, without suitable clothing *(hours/week)* ..... |_|

Indoors, with no heating *(hours/week)* |_|

In cold, with wet clothing *(hours/week)* ..... |_|

Contact with cold objects/tools *(hours/week)* ..... |_|

15.03 **What ambient temperature prevents you from:**

	Under °C
Working outdoors	|_|_|
Training outdoors	|_|_|
Performing other activities outdoors	|_|_|

15.04 **Have you during the last 12 months had a frostbite with blisters, sores or skin injury?**

☐ Yes ☐ No

If Yes, how many times? ..... |_|

15.05 **Have you had itching and/or rash in relation to cold exposure?**

☐ Yes ☐ No

15.06 **Have you during the last 12 months been involved in an accident which required medical treatment where cold was an important factor?**

	Yes	No
At work	☐	☐
In leisure time	☐	☐

15.07 **Do you experience any of the following symptoms while you are in a cold environment? If so, at what temperature do the symptoms occur?**

	Yes	No	Under °C
Breathing problems	☐	☐	|_|_|
Wheezy breathing	☐	☐	|_|_|
Mucus secretion from lungs	☐	☐	|_|_|
Chest pain	☐	☐	|_|_|
Disturbance in heart rhythm	☐	☐	|_|_|
Impaired blood circulation in hands/feet	☐	☐	|_|_|
Visual disturbance *(short term/transient)*	☐	☐	|_|_|
Migraine *(short term/transient)*	☐	☐	|_|_|
Fingers turning white *(short term/transient)*	☐	☐	|_|_|
Fingers turning blue-red *(short term/transient)*	☐	☐	|_|_|

15.08 **How does a cold environments and cold-related symptoms influence your performance?**

	Decrease	No effect	Improve
Concentration	☐	☐	☐
Memory	☐	☐	☐
Finger sensitivity *(feeling)*	☐	☐	☐
Finger skill *(motor)*	☐	☐	☐
Control of movement *(for example tremor)*	☐	☐	☐
Heavy physical work	☐	☐	☐
Long-lasting physical work	☐	☐	☐

16. USE OF NON-PRESCRIPTION PAINKILLERS MEDICATIONS

In the first questionnaire you answered that you had used non-prescription painkillers (analgesic) medications in the last 4 weeks. Here are some follow-up questions we hope you will answer.

16.01 **What types of non-prescription painkiller medications have you used?**

Paracetamol: *(Pamol, Panodil, Paracet, Paracetamol, Pinex)*

- ☐ Not used
- ☐ Less than every week
- ☐ Every week, but not daily
- ☐ daily

How much you take usually daily when you use the medications? *(number of tablets, suppositories)* ..... ☐

Acetylsalicylates: *(Aspirin, Dispril, Globoid)*

- ☐ Not used
- ☐ Less than every week
- ☐ Every week, but not daily
- ☐ Daily

How much you take usually daily when you use the medications? *(number of tablets)* ..... ☐

Ibuprofen: *(Ibumetin, Ibuprofen, Ibuprox, Ibux)*

- ☐ Not used
- ☐ Less than every week
- ☐ Every week, but not daily
- ☐ Daily

How much you take usually daily when you use the medications? *(number of tablets, suppositories)* ..... ☐

Naproxen: *(Ledox, Naproxen)*

- ☐ Not used
- ☐ Less than every week
- ☐ Every week, but not daily
- ☐ Daily

How much you take usually daily when you use the medications? *(number of tablets)* ..... ☐

Phenazone with caffeine: *(Antineuralgica, Fanalgin, Fenazon-koffein, Fenazon-koffein sterke)*

- ☐ Not used
- ☐ Less than every week
- ☐ Every week, but not daily
- ☐ daily

How much you take usually daily when you use the medications? *(number of tablets)* ..... ☐

16.02 **For which complains do you use non-prescription painkiller drugs?** (multiple ticks are possible)

- ☐ Headache
- ☐ Menstrual pain
- ☐ Migraine
- ☐ Back pain
- ☐ Muscle/joint pain
- ☐ Tooth pain
- ☐ Other

16.03 **Do you think you have experienced side effects of some of the medications?** (tick once for each line)

	Yes	No
Paracetamol	☐	☐
Acetylsalicylates	☐	☐
Ibuprofen	☐	☐
Naproxen	☐	☐
Phenazone with caffeine	☐	☐

16.04 **Where do you use to buy such medications?**

- ☐ Pharmacy
- ☐ Grocery
- ☐ Patrol stations
- ☐ Abroad
- ☐ Internet

16.05 **Do you combine the treatment with the use of prescribed pain-relief medications?**

☐ Yes ☐ No

17. FOLLOW-UP QUESTIONS ABOUT SKIN DISEASES

On page 15 in this questionnaire you answered that you have or have had a skin disease. Here are some follow-up questions we hope you will answer.

Answer on a scale from 0 to 10, where 0 corresponds to no symptoms and 10 correspond to worst imaginable complaints. If you answered YES to that you have or have had:

	No complaint	0	1	2	3	4	5	6	7	8	9	10	Worst imaginable complaints
17.01 **Psoriasis**													
· How much are you affected by your psoriasis today?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
· How much are you affected by your psoriasis when it is most severe?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
17.02 **Atopic eczema**													
· How much are you affected by your atopic eczema today?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
· How much are you affected by your atopic eczema when it is most severe?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
17.03 **Hand eczema**													
· How much are you affected by your hand eczema today?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
· How much are you affected by your hand eczema when it is most severe?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
17.04 **Acne**													
· How much are you affected by your acne today?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
· How much are you affected by your acne when it is most severe?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
17.05 **Abscesses**													
· How much are you affected by your abscesses today?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
· How much are you affected by your abscesses when it is most severe?		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	

17.06 **Here is a list of factors that might trigger or exacerbate abscesses, tick for what you think apply to you:**

	Yes	No
Stress/psychological strain	☐	☐
Narrow/tight clothing	☐	☐
Menstrual periods	☐	☐
Pregnancy	☐	☐
Other	☐	☐

17.07 **How many episodes of abscesses do you usually have per year?** (tick once)

☐ 0-1 ☐ 4-6
☐ 2-3 ☐ More than 6

17.08 **How old were you when you got abscesses for the first time?**

☐ 0-12 years ☐ 26-35 years
☐ 13-19 years ☐ 36-50 years
☐ 20-25 years ☐ Older than 50 years

17.09 **If you no longer have abscesses, how old were you when it disappeared?**

☐ 0-12 years ☐ 26-35 years
☐ 13-19 years ☐ 36-50 years
☐ 20-25 years ☐ Older than 50 years

FEEDBACK

Should you wish to give us a written feedback on either the questionnaire or The Tromsø Study in general, you are welcome to it here:

Thank you for your help

Tromsø-
undersøkelsen

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