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Aspects of self-reported oral health among adults in selected municipalities in Northern- and Mid-Norway. A cross - sectional study.

Based on material from the SAMINOR-2 study.

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Submission of this work puts the milestone on the long way of my personal development. The wonderful two years of education in Tromsø have passed as one flash and they changed me forever. There is no misunderstanding anymore between qualitative and quantitative analysis and SPSS doesn't sound as a magic spell. No doubts that my theoretical skills grew up and now I feel myself much more confident in the international scientific environment.

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Going back in my memory, I can admit that the idea to stop temporarily my dental practice and move to Norway to fill some lack of knowledge was one of my best projects.

 Let us see what the next one will be….

Abstract

Background: Dental caries and periodontitis are the pathological conditions of oral cavity having a high prevalence. Caries of permanent teeth and periodontitis have been defined as the first and the sixth most prevalent pathological conditions in the world in 2010, with a global prevalence 35% and 11%, respectively. Such severity leads to deterioration of life quality, causes medical complications and creates a burden for the medical system in general (1).

The causes of the diseases onset are well investigated and properly understood. It has been noticed that the start point of the diseases is associated with the combination of unfavourable factors. Effect of the separate factors unlikely leads to the pathological condition or - at least - does not cause a severe form because of the high resistibility of environment in the oral cavity. There were many factors observed which have a positive association with dental caries and periodontitis and subsequently may act as the plausible triggers or can complicate a course of the diseases.

Aim: To investigate if gender, age, self perceived dental and general health, years of education, income, residence in the Sami language core areas, BMI, diabetes, psychological problems, presence of dentures and use of dental floss have an association with self-reported caries, gingivitis and periodontitis diagnosed by a dentist during last 2 years.

Methods: A cross-sectional study, the Saminor-2 stage 1, was implemented in 2012 in an area where the percentage of inhabitants with Sami background was 5-10%, referring to the census dated by 1970. The study included questionnaires with 97 questions divided into 15 sections. 11600 individuals out of 44669 were enrolled in the analysis that corresponded to response rate - 27%. Differences between groups were tested by the cross tabulation with Chi-square test. Logistic regression was performed to gain a magnitude of the possible odds ratio between predictors and outcome variables.

Results: The result of conducted multivariate analysis revealed the factors affecting the probability of reporting an incidence of caries, gingivitis and periodontitis during the last 2 years as compared with the opposite group. In this way, males were 16% more likely to report caries experience. The age after 50 increased the odds of reporting gingivitis by 50%, periodontitis by 116%. Those who had good self-

perceived dental health were less likely to report caries, gingivitis and periodontitis by 59%, 55% and 88%, respectively. High income (>751000 NOK) reduced the odds of reporting caries, gingivitis and periodontitis by 15%, 24% and 37% respectively; additionally, medium income (451000-750000 NOK) reduced the odds of reporting gingivitis by 15%. Individuals with psychological problems were more likely to report caries, gingivitis and periodontitis by 19%, 34% and 81% respectively. A presence of dentures and daily use of dental floss increased the odds of reporting periodontitis by 132% and 92% respectively.

Conclusions: There were detected life, health and behaviour related factors affecting the probability of the report in respect to an experience with caries, gingivitis and periodontitis during the last 2 years.

Keywords. Caries, gingivitis, periodontitis**,** odds ratio, affecting factors, logistic regression, probability, Sami language core areas.

Content

List of abbreviation

Abbreviation	Decipherment
GR	Gender
AGE	Age
GH	General health
DH	Dental health
LN	Sam language core areas
DH	Dental health
GH	General health
BMI	Body mass index
ED	Education
IN	Income
DM	Diabetes mellitus
PP	Psychological problems
DN	Dentures
Fl	Dental floss
WHO	World health organisation
D2M	Diabetes mellitus type 2
AAP	American association of periodontists.
OHRQoL	The oral health-related quality of life
SES	Socio-economic status
NHANES III	The United States third National health and nutrition examination survey
AL	Attachment loss

The purpose of the thesis

The main purpose of this document is an investigation of special aspects in dental health on the example of inhabitants in the North of Norway. This issue was considered as an important because of the strong evidence that is presented in the official papers. It has been suggested that Northern part of Norway has worse status of oral health among inhabitants (2). This problem challenged me to discover a plausible reason in the framework of the Master Thesis.

The variable ethnicity was not available for the analysis. That means that the presented result of the findings does not reflect the oral health of special groups of people but rather applies to the entire sample on the chosen territories.

Research question: Is there an association between factors related to health, behaviour and life conditions and self-reported experience with caries, gingivitis and periodontitis?

1. Introduction of the issue

1.1. The system of medical service in Norway. Overview of current challenges.

Norway is almost five million's country stretching along the west coast of Scandinavia with varying density of population. Territories on the north are characterised as having a lower density of population and longer distances between communal facilities, as compared with entire Norway (3). These facts suggest that the existed geographical conditions can influence on an unfair distribution of medical resources and differentiation of cost in terms of the health system (3). Current system of health in Norway has a good reflection of challenges and is on the way of permanent improving since 1970. The main objectives of development are the elimination of inequality and improving access to health care settings in the remote areas with insufficient infrastructure.

The focus on optimisation of expenditures and decentralisation of health care service dominated in 1980; since 1990 priority shifted on the efficiency. The nowadays tendency is aiming at the establishment of better coordination between health care providers, patient's safety issues and quality of health services (4). Geographical availability and social equity in access to health care has been challenging the medical system in Norway and is not removed from the agenda even in spite of achieved progress in the medical care system in Norway (4).

Norway takes the first place in the list of development, according to the data of HDI (human development index) with the result of 0.944 in 2013 (5). HD index is a complex measure, which combined the most important foundations of a human being, such as life expectancy, knowledge and quality life standards (6). Rank of evaluation is distributed from 0.000 to 1.000 that corresponds from the worst to the best result, respectively. Based on this knowledge, it is logical to assume that the fact of socio-economic inequality in Norwegian health system should gradually disappear. Nevertheless, the topicality of this issue steel exists. Thus, less educated citizens in Norway demonstrate an increase of prevalence up to 50% in regard to long-term and chronic conditions (4).

Considering the system as a whole, Norway has good achievements according to the satisfaction with health system among the consumers. Life expectancy in Norway is

higher than average in the EU, 81.53 and 80.14 years respectively. Total health expenditure is covered by 85% from the capitation tax and insignificant rest comes from the out-of-pocket payments. The number of physicians and nurses in Norway exceeds relevant medical staff on average in the EU countries (4).

1.2. Dental health in Norway and situation in the northern areas specifically

Health care system in Norway is built on the principle "equal access for equal needs". This feature is relevant for entire Scandinavian region and aims to provide medical service for all stratums of the society (3).

Dentistry is a part of the entire medical system, which may be a litmus paper of the approach correctness when it comes to the system organisation. Tendency during the last 30 years shows improvement in dental health among the population in Norway (7). Studies conducted in 1973, 1983, 1994 and 2006 indicate a significant reduction of DMFT/S values among the older and middle age group. The decrease of the proportion of carious and missed teeth has been observed as well as the increase of treated teeth (8). All these changes occurred with improvements in the efficiency of dental service and a gradual increase in the number of dentists from 1:1731 to 1:1161 and 1:1496 to 1:994 on the period from 1973 to 1994 in the Nord-Trøndelag and Sør-Trøndelag county, respectively (8).

Social inequality in the dental health has been analysed in Norway by Holst D. In terms of data analysis, it has been highlighted that the social inequality reduced dramatically since 1973 till 2006. As a result of the analyses, it has been concluded that the forces creating inequality still exist; inequality reduces in one kind of parameters but increases in others; dental health status is more equally distributed now than before and inequality affects vulnerable groups stronger as compared to population as a whole (7).

Other sources point out on the direct dependency between a status of dental health and place of residence in Norway, in terms of geographical position. It has been found out that the farther to the North, the stronger deterioration of the dental health (2).

The rapid increase of elderly people proportion is a general trend for the entire well-developed industrialised world (9). That creates a new challenge in population in the

form of age-associated edentulousness among elderly. In 1979 the WHO established a resolution aiming at the achievements of improvement in health till 2000. Dental health was also a part of the initiative. It has been stated that quantity of edentulousness among aged 65 and above should be reduced by 25%. That group should also have at least 50% of individuals who have 20 or more retained and functional teeth (10). A survey conducted in Norway indicated that achievements of the WHO resolution are far away from the fulfilment, especially in the northern areas. The analysis was conducted in the 11 counties in Norway in 1996-1999 among the participants aged 67 and above. The main conclusion was that - "In region A (South-East counties including the capital Oslo), region B (West-Central counties), and region C (Northern counties) the prevalence of `own teeth only', `own teeth and dentures' and `dentures only' were 62.0, 26.5 and 11.1% in region A, 27.7, 28.9 and 43.1% in region B and 2.9, 28.6 and 65.7% in region C, respectively" (11).

A survey among 3 years old children found out that 87% of children are caries-free in Norway, but this value is distributed unequally across the country. The highest rank of 91% was detected in Akerhus (south region), the lowest - 78% observed in Nord-land (2).

All these facts evidence that the Northern region of Norway stays in the disadvantaged position as compared to the rest parts of the country in terms of dental health.

1.3. Background and theory. Caries

Dental caries is an infection, transmittable pathology affecting all surfaces of the tooth enamel. Dental caries is one of the most common diseases worldwide; all ages have a susceptibility to caries. There is a pretty low chance to avoid experience with some types of caries manifestation during life course, even in spite of absolute preventability (12). The development of caries should be considered as a complex pattern covering the interaction between acid-producing bacteria and a number of host factors. There are numerous predisposing factors, which separately or in combination play the role of a trigger for the start of enamel lesions. Physical, biological, environmental, behavioural and lifestyle factors contribute to the risk of caries development. The decrease of saliva flow, poor hygiene, high level of pathogen germs

contamination, poverty and intake of carbohydrate rich nutrients are some of the factors contributing to the caries occurrence and severity as well (13). The initial lesion is potentially reversible, so the start of penetration can be arrested as a result of a remineralisation function of saliva (14) and perhaps a favourable absence of risk factors associated with the onset of disease. In general, dental caries may be explained as a shift of ecological balance between minerals structure of the tooth and microbial biofilms (15). Microbial biofilm contributes to all types of caries and has a diversity of microorganisms however it has been identified a distinct pathogenic role of Streptococcus mutans, Streptococcus sobrinus and Lactobacillus. The composition of pathogen germs releases organic acid as a result of metabolism. The acid diminishes the value of pH in the oral cavity that subsequently leads to demineralisation and forming of a cavity (16)

Traditionally classification of dental caries has been based on depth, shape and consistency of lesion. Nowadays this pattern underwent a correction due to decrease in the prevalence of caries. The decrease of prevalence initiated the tendency when the intensity of the process becomes more important measurement of caries classification, which described as acute and arrested processes (17).

In 2010 it was detected that pathological oral conditions affected 3,9 billion people. Caries contributes significantly to the entire burden of diseases, thus it has been recognised as a most prevalent condition with the 35% of prevalence worldwide for all ages. Adjusting for deciduous teeth gives more positive tendency - 9% of global prevalence that corresponds to the 10th in the list of the most prevalent pathological conditions in the world (1).

The distribution of caries prevalence is unequal around the world. The general trend observed in the developed countries suggests the decrease of prevalence and severity during the last decades (18). However, the developing world demonstrates less positive tendency with even an increase of prevalence of caries in some regions. Researchers attributed the deterioration to more free access to carbohydrates and inadequate exposure of fluorides (19).

A systematic review performs a holistic view of many authors who agree that the use of fluorides in various forms is a key factor of reduction of caries prevalence. They

described several possible methods of fluorides supply such as general fluoridation of water, usage of dietary supplements, fluoride tablets, gels and toothpaste (20). Norway's experience may bear evidence of a positive role of fluoride. It has been identified a decrease in caries prevalence from 1972 and active usage of fluoride in the preventive programs was recognized as the important prerequisite of such improvement (20).

1.3.1 Caries and factors related to individual parameters

Gender. A sex-related difference - more known as sex dimorphism – has been highlighted since 1952, when The National Research Council defined that females are in a bigger predisposition to caries than males. Further researches maintained this pattern and a modern concept suggests women's gender as an associative factor to the increase of caries prevalence. This association holds true in various point of time for different societies with diverse cultures and consumption style (21).

Saliva is perhaps taking the most important role in the predisposition to caries. It is a generally known fact that saliva provides a protective function because of the ability to wash the surface of teeth, remineralize enamel and restrict the reproduction of pathogen germs. The less saliva is released, the worse resistance against caries will be. Women, in that case, are in more disadvantaged position. The evidence suggests that a mean salivary flow rate in males 0,59 ml/min but for women, this parameter was 0,45ml/min (22). Pregnanc*y* is also associated with a reduction of saliva production: 0,21ml/min for pregnant women in general against 0,30 ml/min for a group of control (23).

In the dominant number of cultures in worldwide, women traditionally are responsible for making food. That gives an increase of association with caries. The root of such interaction lies in a more free access to food or irregular snacks and in an increased frequency of meals (24).

Age. The process of caries development does not have its peculiarity regarding the age and goes in accordance with a general pattern. It is based on enamel demineralization as a result of the acid action. The initial process can be either demineralized or arrested or undergo a further penetration into dentin (25). The difference becomes more explicit when it comes to the elderly population who are in

the last phase of life. This phase can last as long as 40 years and is associated with the deterioration of general health and dental health as well (26). The factors associated with a decrease of resistance to caries in the elderly age are well highlighted and cover many aspects of life. For example, it has been indicated the following risk factors for development of caries in the elderly age: attachment loss (27), mouth dryness (28), presence of restorations (29), institutionalization (30), medical problems (stroke) (30), residence in rural setting (31), low level of literacy (31), shortage of manual skills and difficulties with following of oral care instructions (32).

Body mass index. Possible relation between caries and obesity may be explained indirectly by the increase of consumption nutrients. The consumption of carbohydrate-rich nutrients creates a high risk for the demineralization of enamel and deposition of fat (33). This pattern can rather explain a causality but less likely an association. In addition, it is not quite clear the role of confounding factors and effect modifiers (34). Nevertheless, there is evidence suggesting about both positive and negative association.

A systematic review conducted in 2006 indicated three studies with reliable evidence about a positive correlation between caries and obesity (33). Another study suggested that a cohort with severe obese has a significantly higher chance of caries development as compared with the opposite group (35).

At the same time, there is evidence suggesting about a contrary point of view. When it comes to the young population the association becomes non-significant. For instance, study carried out among 3-year-old children did not find a correlation between carious of temporary teeth and BMI (36). A systematic review of 28 selected articles found no sufficient association between caries and BMI and did not explain the effect of modifiers either (37).

As we can see, obtained evidence are rather controversial and this topic needs to be studied further.

1.3.2 Caries and factors related to health

Diabetes mellitus. Diabetes mellitus is well investigated as a risk factor of a number of pathological conditions. The role of DM in the condition of oral health is also important. DM has an association with the most common dental pathologies such as periodontitis, caries, salivary dysfunction, oral mucosal diseases and oral infections (38). In spite of the existed evidence about the presence of more severe caries among groups with DM (39, 40), the general pattern of association is not clear understood yet (41). One of the possible reasons of such association may be explained by the reduction of saliva secretion. Reduction of saliva secretion has been reported as a predisposing factor for dental caries but dryness in its turn is associated with a poor glycemic control (42).

Psychological problems (stress). The issue of association caries and psychological-social factors is not widely discussed in the scientific papers. The obtained evidence comprises unsystematic facts and a systematisation of this issue remains to be done. Nevertheless, there are some data, which allow speculating about this topic.

It has been found out that those who experienced a mental stress have a higher chance to develop caries (43). Negative life events have also been associated with root caries in the elderly group (44). Psychological factors may also act in combination with social factors and together create an association. For instance, marriage has been estimated based on its quality. Those who considered own marriage as a good enough, from the point of view of psychological coherence, reported lower caries prevalence, than those who experiencing psychological problems with a spouse (45). In the study, aimed to investigate risk factors of acute caries it was defined that 96% of the group of interest reported a severe stress in past. A control group without acute caries had only 2% of responders who noted a severe stress before the time of follow-up (46).

The most plausible theory of the relation between caries and stress perhaps is based on the influence of saliva. Individuals under psychological burden are more prone to release catecholamines (epinephrine and norepinephrine), which in its turn provoke a decrease of salivary flow (47, 48). The decrease of saliva leads to weakening of protective and regenerative function and consequently creates the risk of caries (48, 49).

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1.3.3. Caries and factors related to socio-economic status

The evidence-based observations suggest that reduction of caries prevalence has been taking place during the last decades in both developing and developed countries (50). The socio-economically disadvantaged populations demonstrate however a less encouraging tendency, the level of caries prevalence remains relatively high. The SES indicators, in that case, may reflect various aspects of a human life such as occupation, education level, income, community index and position in society (51). That suggests that the SES indicators play a role of risk factor for caries in the disadvantaged areas or stratums of society (47, 52).

The evidence published in 2011 gives the concept that SES plays not only the role of predictor of pathology but acts also as a causal factor (53). This concept is also applicable to caries. The causality of SES may be explained as follows - the low position in SES restricts the access to healthy food, oral hygienic facilities and dental service. The shortage of general knowledge does not allow the individual to form a correct pattern of healthy lifestyle and healthy dental habits. The result of this process is not only the increase of prevalence but the rising of frequency and severity as well (54).

Oral diseases were the objects of research, which aimed to find an association with the changing of SES. It has been found out that caries is in a significant association with SES and takes the place between oral cancer and periodontitis, which are also significant (55).

Costa et al. conducted a systematic review in 2012 where they found numerous papers related to the desired topic but at the same time, they faced heterogeneity of the studies. Additionally, they had to adjust the association relatively to confounding factors and mediators. In spite of these challenges, they concluded that SES is significantly associated with caries and especially with a greater severity of caries among adults (51).

1.4. Background and theory. Periodontal pathology

Periodontitis is a pathological inflammation process involving a complex of tissues with a tooth-supporting function (56). Periodont - as it is known - consist of the four tissues, having a different morphology but performing the same aims provision of nutrients, prevention of overloading and retention of teeth. Gingiva, periodontal ligament, root cement and alveolar bone make up the periodont as a single organ.

Pathological process in periodont is roughly divided into two types, such as: the reversible type, which affects a superficial level and irreversible type, which is associated with structural consequences or the teeth loss (56). There is evidence suggesting that some forms of periodontal pathology remain stable during the life course and do not create a severe threat to oral health (gingivitis); but other forms have a rapid development and cause a structural deterioration of periodont, even with a risk of a tooth loss (periodontitis) (57).

Periodontitis has a broad range of manifestations, depending on etiology; however, the basic features remain the same. Redness and pain are the initial indicators of inflammation coming with the accompaniment of swelling and bleeding (58).

Severe periodontitis was the sixth-most prevalent condition in 2010, which spread among over 743 million people worldwide or 10,8% of the population on average (1). Richards et al. in 2014 defined the prevalence mean score across 37 countries and detected a strong deviation from 4,2% till 20,4% in different geographical areas (59).

Development of periodontology gave us a number of classifications of periodontitis aiming at the selection based on genesis, manifestation and etiology.

It has been decided to take into consideration in this document the classification performed by the American Association of Periodontology (AAP) in 1999 (60). They described periodontitis in the six categories:

1. Aggressive periodontitis.
2. Periodontitis as a manifestation of systemic diseases
3. Necrotizing periodontal diseases.
4. Periodontitis as a manifestation of systemic diseases.

5. Periodontitis associated with endodontic lesion.

6. Periodontists from the development or acquired deformities and conditions.

The WHO suggested applying Community periodontal Index (CPI) as a worldwide measurement of periodontitis prevalence (61). This index is based on a simple principle of measurement: score 0 - healthy periodontal conditions; score 1 - gingival bleedings; score 2 - calculus and bleeding; score 3 - shallow periodontal pockets (4 to 5 mm.); score 4 - deep periodontal pockets (6 mm. or more).

Petersen presented in 2009 a graph of the distribution of different types of periodontitis across the World regions (see Figure 1). The analysis has been done with the use of CPI and indicated that the proportion of population without any symptoms is very low; calculus is the most common condition; cases are distributed unequally within the regions (61).

Figure 1. A distribution of CPI within the World regions (61)
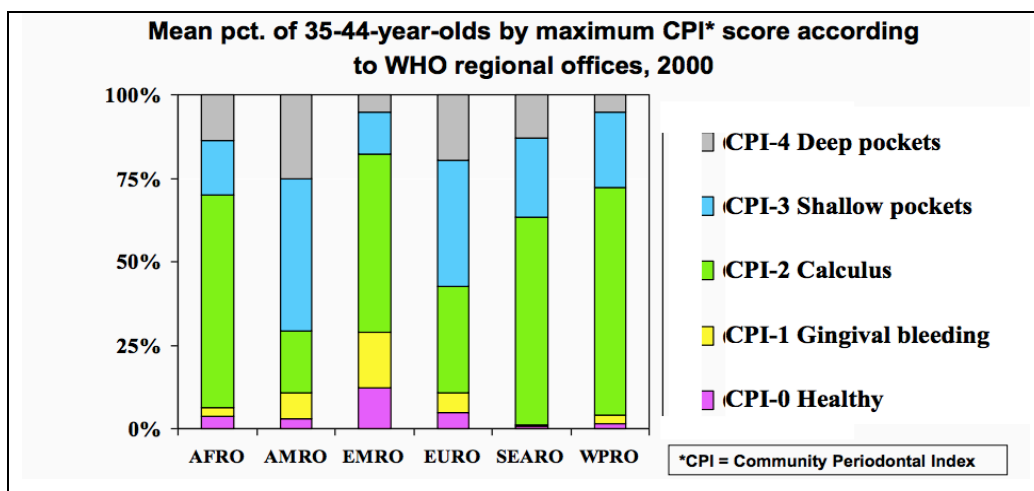
The concept of the CPI or its variety - known as CPITN - supposes a hierarchical sequence of the symptoms and scores, respectively. It is assumed that CPI-3 should have calculus and bleeding, besides the main symptom – shallow pockets (62). In reality, this principle demonstrates a limitation when it is applied to a local population with its features. Hence, regarding the Norwegian population, 30% of representatives with calculus did not present bleeding, 25% with pockets and bleeding did not indicate calculus (62). In the Japanese population, the same trend was found: 47,5 %

of representatives with score-2 (calculus) did not have bleeding that corresponds to the score-1 (62).

The index of CPITN is not stable through the time perspective when assessing on the example of the Norwegian population. The analysis conducted in Oslo in 2007 revealed a great changing. Hence, a score - 4 that corresponds to severe periodontitis demonstrated a decrease from 21,8% in 1984 to 8,1% in 2003, respectively (63).

1.4.1. Periodontal pathology and factors related to individual parameters

Gender. Sexual dimorphism is well-known phenomenon for many pathological conditions when the sex predetermines initiation and outcome of diseases. It has been shown that females are more predisposed to inflammatory response but males experience a higher risk of getting shock, trauma and sepsis (64).

Detection of sex difference in respect to periodontitis is important through the perspective of understanding pathogenesis and application of the risk assessment model (65).

Analysis of data from the National Health and Nutrition Examination Survey I in the USA gave result about a higher predisposition of males to periodontitis. It has been concluded that indication of calculus among males occurs more often; the sex-related differences were presented in the aspects of oral hygiene or professional care (66). A subsequent study NHANES III reported also a poor oral hygiene among males. Furthermore, it has been found out that the level of attachment loss (AL≥4) has higher prevalence in males than in females (67).

The systematic review carried out in 2010 summarized all relevant and existed data. The main result of the review was as follows - males experience a higher chance of getting destructive periodontitis, however, a rapidity of the periodontitis development remains identical for both genders (65).

Age. The evidence obtained in different studies suggests either positive (68) or negative (69, 70) association between ageing and development of periodontitis. There was a question whether severe periodontitis is just a demonstration of course of the disease on the late phases of life or maybe ageing plays the role of periodontitis promoter. It has been understood a cumulative effect of ageing, in particular, non-

reversible destruction of periodontal tissue and deterioration of reparation function. Thereby, the conclusion revealed that ageing and periodontitis create an association rather by the deterioration of recovery function but unlikely by the promotion of the disease development (71).

Body mass index. The argument that periodontitis is linked to obesity has a biological explanation. Adipose tissue has been known as the source of inflammation mediators, cytokines and hormones. The increase of such chemicals secretion can shift the immune response of periodontal tissue regarding the external oral environmental factors (72).

The evidence obtained in recent studies does not create an undeniable concept about the strong association between periodontitis and obesity. A Finnish study carried out in 2010 found no significant association among 396 participants. However, such negative association is rather an exception as a result of limitations of the study but not strong evidence (73). The United States Third National Health and Nutrition Examination Survey had three analyses and a positive association was found in each of them performed in different manners. The most interesting were: weight-to-hip ratio, BMI and free fat mass are positively associated (74); BMI<18,5 predicted a decrease of periodontitis when it comes to underweight (75); adolescents 17-21 years have an increase of periodontitis for each additional $1kg/m^2$ of BMI and for each 1 cm in waist circumference (76). The studies from other geographical regions such as South Korea (77) and Jordan (78) maintain the concept of the positive association between periodontitis and obesity.

1.4.2 Periodontal pathology and factors related to health.

Diabetes mellitus (DM). Periodontitis is well recognised as one of the "classic" complications of diabetes together with cardiovascular disease, neuropathy, nephropathy, retinopathy, bunions, osteoporosis, Alzheimer's disease and cancer (79).

The relationship between DM and periodontitis is widely approved as *two-ways or bidirectional relationship*. Such terminology was put into use due to the ability of periodontitis to affect and complicate the course of DM; and vice versa the ability of DM to complicate the course of periodontitis. The main mechanism of the feedback

lies in the secretion of inflammatory mediators during the course of periodontitis. The mediators in its turn can influence glucose and lipid metabolism (80).

A bidirectional relationship was the object of a review covering a period of 50 years and including papers released in English related to the main topic. It has been found more than 200 articles. Interpretation of the main result was complicated due to the heterogeneity of the studies. Nevertheless, the author concluded about numerous evidence in respect to the bidirectional association (81). The example of such evidence can be observed on the example of a study conducted in the USA among residents of the Gila River Indian Community. Individuals with D2M, who were between 15 and 57 years old, experienced 4,23 times higher risk of the development of alveolar bone loss in comparison to the individuals without D2M (82).

Psychological problems (stress). A systematic review published in 2007 had the aim to justify whether there is enough evidence to consider stress and psychological factors as provocative triggers leading to the onset of disease. A dominant majority of articles 57,1% found a positive relation between stress and periodontitis; 28,5% found both positive and negative relation for some aspects; 14,2% observed a negative outcome (83).

This interaction lies on the level of cellular immune response. Some studies explain such interaction by the action of three mechanisms (84, 85). First is a stress-induced response. Corticotropin-releasing hormones from the pituitary gland and glucocorticoid hormones from the adrenal cortex are released due to the activation of hypothalamo-pituitary-adrenal axis. Glucocorticoids in its turn slow down the formation of interleukins, prostaglandins and tumor necrosis factor. Second is based on the stressor agents, which provoke the sympathetic nervous system to initiate the release of adrenalin and noradrenalin, thereby to launch the immunosuppressive effect. (86) Third, stress can lead to the outlet of neuropeptides from the sensory nerve fibbers. Neuropeptides are a neurogenic promoter of the inflammatory process affecting the immune system (87). (See figure 2 below)

Figure 2. Model of the development of periodontal disease due to stress (88).
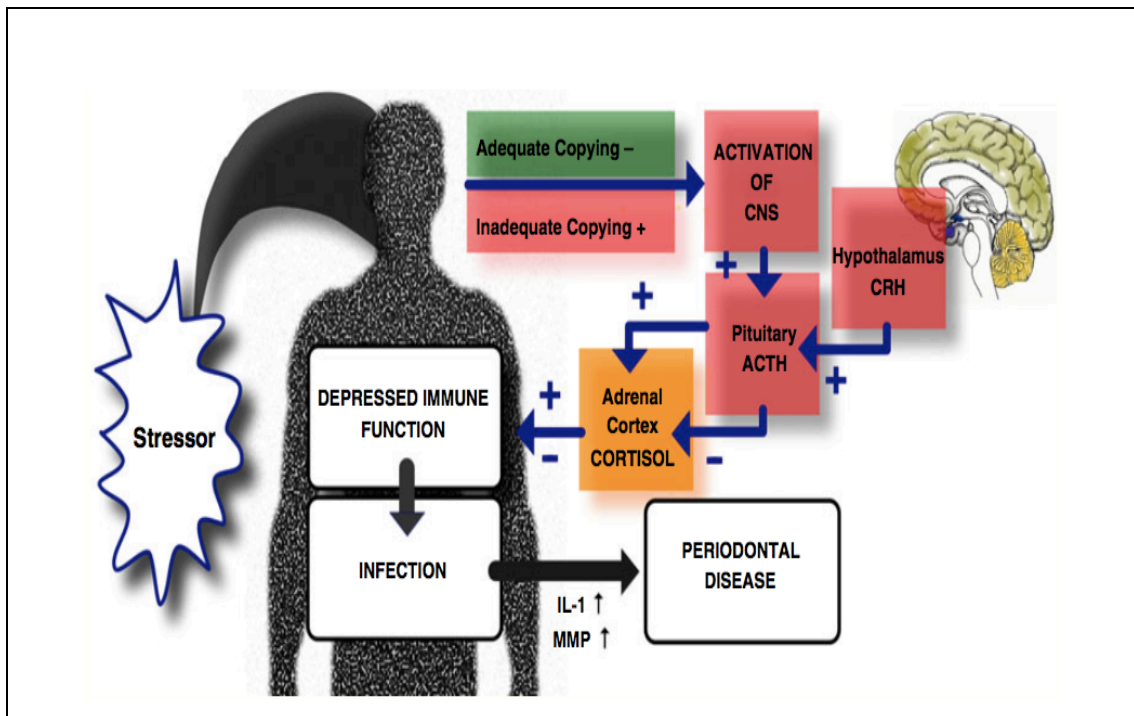
1.4.3. Periodontal pathology and factors related to socio-economic status

It has been long accepted that SES and health status are in a direct association. Traditionally, such explanation refers to those who are living bellow the poverty line but does not explain the gradient of pathology distribution within the SES ladder (89). This pattern holds also an importance for periodontal pathology and SES. There is a significant amount of studies already done that can shed a light on the association between periodontal pathology and SES (90, 91). Some studies represent result for the different keys-definitions of SES. For example, Gundala and Chava in 2010 suggested that the chance of periodontitis development decreases if the value of income and the duration of education move up on the scale (92).

Other studies pointed out that low income and location of living are also the risk factors for periodontitis development. Examination of 761 adults was conducted in order to indicate the attachment loss and related risk factors. The rural residence and low income were defined as significant risk indicators of periodontitis pathology (93).

1.5 Oral diseases and dental habits.

The first evidence suggesting about an essential improvement of health status began to appear in 1970. In that time reduction of DMFT index among adult and young has been explained by the improvement of nutrition and diet, consumption of fluorine and better oral hygiene. In the early years of the oral hygiene promotion, the concept was formulated in the proverb - "A clean tooth never decays", however this phrase did not have a strong scientific support then (94).

Nowadays, conducted studies found out the interplay between proper hygiene and caries formation among the groups with a special risk - children and elderly. Yi-Chen Cheng et al. in 2014 defined that mouth cleaning after sweets, brushing after eating and duration of brushing at least 3 minutes can effectively predict a magnitude of DMFT among school children (95).

Data collected among 151 home-dwelling elderly by Stromberg et al. indicated that a good oral hygiene habits – among others factors – increases the chance of not developing caries. Additionally, a good oral hygiene was associated with less dental plaque and oral diseases (96).

Today, there are many dental accessories presented on the market with a diverse design and an application technic. Roughly, they can be divided into the two groups – for brushing of external surfaces and interdental spaces (94).

The documentary evidence suggested an important role of dental brush in terms of removing of dental plaque from the external tooth surfaces and subsequent reducing the risk of caries. Pita-Fernandez et al. in 2010 conducted a prevalence study and indicated that the prevalence of caries among children who never brushed their teeth was in 62% higher as compared with those who brushed their teeth regularly (97).

The same positive association detected for the interaction between periodontal diseases and tooth brushing. Zimmermann et al. in 2015 conducted the overview and detected that infrequent tooth brushing increases the odds by 41% for the development of periodontitis as compared with a frequent tooth brushing (98).
When considering the role of dental floss used for the brushing of interdental spaces, existing evidence is not enough to make conclusion in favour of the dental floss. In

this way, the Cochrane official source says that there is no evidence suggesting effectiveness of dental floss for prevention of caries, weak evidence in regards to reduction of plaque and some evidence for the preventive ability of dental floss in regards to gingivitis (99).

1.6 Indigenous people and dental health.

Indigenous people are represented in the World as a group of 370 million people living in more than 70 countries or geographical regions, according to WHO. The groups of indigenous people still have a tight connection to the traditional lifestyle, religion, language and culture, inherited from the ancestors. This features make them the most marginalised group in the modern world (100). The concept of indigeneity was formulated by WBO in 2007, describing several main points. So, people with an affiliation to indigenous group should – "Identify themselves and are recognized and accepted by their community as indigenous; demonstrate historical continuity with pre-colonial and/or pre-settler societies; have strong links to territories and surrounding natural resources; have distinct social, economic or political systems; maintain distinct languages, cultures and beliefs; form non-dominant groups of society; resolve to maintain and reproduce their ancestral environments and systems as distinctive peoples and communities." (100).

An estimation of health-related conditions shows that the indigenous people are in the disadvantaged position as compared to other groups on the same territory. It has been discussed that the prevalence rate of diabetes among the aborigines is in six times higher than in the general population; suicide rate among Inuit youth in Canada is the highest in the world; an average mortality rate among indigenous children in Panama is over three times higher as compared with the entire population (100).

The same negative tendency takes place when estimating a dental health. Prevalence of dental caries in both deciduous and permanent tooth among children with indigenous background in South Australia was two times higher as compared to non-indigenous children (101). Significant difference between Inuit and non-Inuit adult respondents was detected in Canada when assessing oral health by checking of the DMFT and periostatus. The Intuits had worse results and needed more treatment (102).

2.0 Material and methods

Analysis of the dental health aspects in the Mid and Northern Norway has been conducted based on the data from the SAMINOR project. Information in regards to the project details is available on the official homepage of the project (103) and a number of related articles (104-106). Additionally, some extra information was obtained personally after the contacts with the scientists who are responsible for the project, during the conferences and presentations. Exp. (107)

2.1 SAMINOR project

Saminor study was established in 2003 as a project with special focus on the ethnic minority group - Sami, living in the Mid and Northern Norway. The fact has been widely known before, that this ethnic group has been experiencing an alteration in regards to the general health status in comparison with a titular national group (108). The root of this issue lies in the historical aspects, which took place in Norway. It has been discussed that colonization, discrimination, modernisation and marginalisation of the Sami culture and identity affected crucially the well-being and general health specifically (109).

The main purpose of the study is an indication of the special peculiarities in the health status based on the samples from different municipalities with ethnically mixed population. The project included the municipalities where percentage of inhabitants who reported to be Sami is more than 5 %. Altogether it consisted of 24 municipalities (110). A cross-sectional and semi-longitudinal design have been chosen for the study because of the ability to discover risk-associated factors and obtain scientific evidence in regards to the issues of body health, mental health, medical services, and self-perception of health (106).

The Saminor project has been implemented in the several approaches - Table 1. It has been done in order to conduct a follow-up in longitudinal perspective and because of the inclusion of new aspects, which were not disclosed at the start of the project (106). An example of the additional topic is dentistry, which is a topic of the presented thesis. Data for this analysis has been extracted from the SAMINOR-2, stage-1.

Table 1. *A sequence of the stages for SAMINOR from 2003 till 2014. (103)*

Stages of the study	Year of the start	Total amount of participants	Age group
SAMINOR-1	2003-2004	16865 males and females	30; 36-79 years
SAMINOR-2	2012-2014		
Step-1questionnaries	2012	11600 males and females	18-69 years
Step-2 clinical examination	2012-2014	6004 males and females	40-79 years

2.2 SAMINOR-2. Sample

Study sample was selected based on the registration of inhabitants in the Norwegian National Population Register. Those who were registered by 1-st December 2011 were recorded as potential participants and their contact information was used for the invitation. The inhabitants at the age 18-69 in the selected 25 municipalities were eligible to participate, that has given a sample with 44669 individuals. All potential participants had to meet one selection criteria, it is a readiness to fill in questionnaire, sign and send the informed consent back (106). There were 1424 invitations returned back because of a wrong address or change of the recipient residents, hence they were excluded. In total 43245 persons were deemed as those who were invited. The number of enrolled participants was 11600, which corresponds to 27% response rate – table 2. Among those, 15.9% responded on the web and 84.1% preferred traditional post envelope (106).

Table 2. *Selection of the sample for SAMINOR-2*

Stages	Number	Details
Invitation	44669	Total amount of inhabitants who meets the age criteria (18-69 years)
Exclusion	43245	1424 were excluded because of the technical fail (wrong address or recipient)
Enrolment	11600	Recipients who gave informed consent. In total 27%

2.3 SAMINOR-2. Area

SAMINOR-2 included one additional municipality in comparison to Saminor-1 and hence covered 25 municipalities: Sør-Varanger, Nesseby, Tana, Lebesby, Karasjok, Porsanger, Kvalsund, Loppa, Alta, Kautokeino, Kvænagen, Kå-fjord, Storfjord, Lyngen, Lavangen, Skanland, Evenes, Narvik (Vassdalen), Tysfjord, Hattfjelldal (Hattfjelldal), Grane (Majavatn), Namskogen (Trones and Furuly), Røyrvik, Snåsa (Vinje) and Røros (Brekken). In some cases, parts of the municipality were chosen (106). Municipalities have been selected either as entire district or partially, which are specified in the brackets above.

Figure 3. *Area of the sample for SAMINOR-2. (106)*

2.4 SAMINOR-2. Sample. Sami language core areas

Norwegian authority approved the official law by 12 June 1987 nr. 56 § 3-1 nr. 1; according to it, all territorial units obtained a right to self-define itself as a Sami language core area. It has been applying to the humanitarian aspects of life, for instance education, culture, language of the public meetings (111). At the date of the law acceptance, there were 7 municipalities with the Sami language core affiliation. However, at the start of Saminor project their amount has increased to 10 (amendment 12 okt. 2012 nr. 964) (111). In this manner, municipalities Karasjok, Kautokeino, Nesseby, Porsanger, Tana, Kåfjord, Tysfjord, Lavangen, Snåsa, and Røyrvik were included in the analysis as the areas with higher affiliation to the Sami language. This fact was used to investigate whether there are some health-related differences between Sami and non-Sami language core areas.

2.5 SAMINOR-2, Instruments (questionnaire)

Filled questionnaires were sent to the SAMINOR authority either by ordinary mail or web-based. A minority of the sample (16%) preferred sending the web-based answers. The questionnaire consisted of 8 pages written in Norwegian but also translated into Sami, Northern, Lule and Southern Sami languages for the specific districts. The questions in the questionnaire pursued the goal to re-evaluate the results in longitudinal perspective since the SAMINOR-1 has been completed, but new questions with specific aims have been also included.

The questionnaire had a nature of self-evaluation and self-perception of own health. The issues of socio-economic status, physical activity, BMI, mental health, education, satisfaction with the types of medical service, and language affiliation have been covered. Also, the problems of discrimination, tobacco or alcohol use, suicide, gambling, violence and abuse have been elucidated. Dental health-related section had 13 questions in regards to diagnoses during last 2 years, regularity of a visit to the dentist and a reason for the delay if it happened, hygienic skills, consumption of sugar, a presence of artificial dental constructions, satisfaction with own dental health and dental service in the municipality (112).

The questionnaires consisted of 97 questions (see appendix) among which 19 were used in this thesis. A section "Family and language background" included 4 questions and one of them (number 12) asked directly about the ethnical affiliation. However, the variable of ethnicity was not available for this document hence, was not included in the analysis.

2.6 SAMINOR-2, Variables

The analysis included 15 variables created based on the items from the questionnaire - Table 3. Selected variables reflected general health, dental health, life conditions and dental hygiene. The variables underwent some modifications in order to make them more suitable for the chosen analyses and the logistic regression specifically (113).

Outcome variables

Three dental health-related variables – self-reported caries (CS), gingivitis (GS) and periodontitis (PS) – were deemed as the dependent variables of outcome. These variables were set into analyses based on the diagnoses given by dentist during last 2 years. Respectively, the participants could give a response –"Yes" if they were diagnosed and "No" if there were no diagnoses in the anamnesis. These options were coded in the SPSS as caries, gingivitis, and periodontitis – 1; no caries, no gingivitis and no periodontitis – 0. The third alternative – "Do not know" – was small enough for all variables and was not targeted as an aim of the study, thus was excluded from the analyses and placed in the section "Missing".

Independent variables

The variables of the general health state included - among others - the information about self-reported diagnosis of Diabetes mellitus (DM) and psychological problems (PP), self-evaluation of general health (GH). Health-affecting factors have been enrolled in the analysis as variables BMI, income per year (IN), education (ED), language core area (LN), age (AGE), and gender (GN). Dental-related factors have been selected as a self-evaluation of dental health (DH), presence of the artificial dental constructions, dentures (DEN) and a frequency of the floss use (FL).
Some modifications have been made in order to conduct the analysis.

Self-perceived general and dental health was ranged in the following four variances – "Poor", "Not so good", "Good", and "Very good". These four categories were shrunk into only two and reflected negative and positive self-estimation, re-coding 0 and 1, respectively.

Diabetes mellitus (DM) and psychological problems (PP) have not undergone re-coding and retained an initial coding 0 – "No" and 1 – "Yes".

Body mass index did not have a special item in the questionnaire but it has been assumed to be an important affecting factor, thus the variable was calculated based on the available in the SPSS self-reported weight and height. The WHO says -"BMI is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m2)" - (114). Using this principle, BMI was calculated and divided into 4 categories: underweight (BMI: <18.5); normal weight (BMI: 18.5-24.9); overweight (BMI: 25-29.9) and obesity (BMI: ≥30), that corresponded to coding 0, 1, 2, and 3, respectively.

Education (ED) was created initially in the form of continuous variable. A transformation from continuous to categorical variable was done with a division into 5 categories. It covered individuals with the lowest education (<7 years), primary school (7-9 years), secondary school/crafts education (10-12 years), lower university/crafts education (13-15 years) and higher university education (16-18 years) that corresponded to coding 0, 1, 2, 3, and 4 respectively. The respondents who reported more than 18 years of education duration were in the amount 956 or 8.4%. That is thought-provoking about a response bias which may increase a proportion of this group. In order to eliminate a negative effect on the reliability of analyses, the group "more than 18 years of education" was excluded from the analysis and removed to the section "Missing".

Income had a wide range of the responses and included 7 options, from income less than 150 to income more than 900 K. NOK per year per family. This range was transformed into 3 categories in order to make it more suitable for the analysis. The new re-coded variable consisted of the options low income (<150 – 450 K. NOK), medium income (451-750 K.NOK) and high income (>751 K.NOK) with a coding 0, 1 and 2 respectively.

There were 25 municipalities included into analysis, each of them had a sequence number corresponding to an official numeration of all 428 municipalities in Norway (115). This variable was used to construct a new variable – language core area (LN), where a separation line was between administrative Sami region and non-Sami administrative region, which in its turn can be understood as more and less Sami cultural background (111). Sami language core area covered 10 municipalities – coding 1; non-Sami language core area included 15 municipalities - coding 0.

AGE was performed in the analysis as a continuous variable but further was dichotomized in 2 categories using the median as a cut-off-point: young age (18-50 yrs.) and old age (51-69 yrs.), coding 0 and 1, respectively.

Gender GN had initially a coding 1 – male and 2 – female, however, the considered logistic regression required a presence of the coding for one of the options as 0 (113). Hence, female was re-coded in 0; male retained the same coding 1.

Dentures DN reflected two options of the response – "Yes" and "No". This principle was retained for the analyses and the variable got a re-coding 0 – "No" and 1 – "Yes".

Dental floss FL was included into analysis based on the self-reported frequency of the use of floss. Participants chose among four options seldom or never, irregularly each month, irregularly each week, and regularly daily with a coding 1, 2, 3, and 4 respectively. This range was changed with a transformation into two options: irregularly use (not daily) – coding 0 and regularly use (daily) – coding 1. Question number 54 in the questionnaire had seven different options in respect to the method of dental hygiene. Nevertheless, it has been decided to consider an issue of dental floss specifically due to controversial evidence suggesting in favour of this method of oral hygiene (99). (For more details see table 3)

Table 3*. Description of the variables and re-coding.*

Variables, abbreviation	Formulation of a question	Coding and categories	Re-coding and categories
Health-related variables (predictors)			
Diabetes mellitus, DM	Do you have or have you had diabetes?	0 – No 1 – Yes	No changes
Psychological problems, PP	Do you have, or have you had psychological problems?	0 – No 1 – Yes	No changes
Self-perceived General health, GH	What is your current state of health?	1 – Poor 2 – Not so god 3 – Good 4 – Very good	0 – Negative 1 – Positive
Body mass index, BMI	Calculated based on the self reported weight and height	0 – <18.5 1 – 18.6 - 24.9 2 – 25 - 29.9 3 – >30	No changes
Education, ED	How many years of education have you had?	Education in years	
		Continuous variable from 0 till 32	0 – < 7years 1 – 7-9 2 – 10-12 3 – 13-15 4 – 16-18
Income per year, IN	How large is your family's/household's income each year?	Income in K. NOK	
		0 – < 150 1 – 150-300 2 – 301-450 3 – 451-600 4 – 601-750 5 – 751-900 6 – > 900	0 – low < 150-450 1 – medium 451-750 3 – high > 751
Language core area, LN	Municipality	Continuous variable from 1640 till 2030	0 – non-Sami language 1 – Sami language
Age, AGE	Age	Continuous from 18 till 69	0 – before 50 1 – after 50
Gender, GN	Sex from registry	1 – female 2 – male	0 – female 1 – male
Dental-related variables (predictors)			
Self-perceived dental health, DH	How would you rate your dental health?	1 – Poor 2 – Not so good 3 – Good 4 – Very good	0 – Negative 1 – Positive
Dentures, DEN	Do you have dentures/false teeth?	1 – Yes 2 – No	0 – No 1 – Yes
Dental floss, FL	Do you use dental floss - and in case how often?	1 –Seldom/never 2 – Irregularly each month 3 – Irregularly each week 4 – Regularly/daily	0 – Irregularly/not daily 1 – Regularly/daily
Dental-related variables (outcome)			
Self-reported caries, CS	Have you during the last two years got the diagnosis cavity in one or more teeth?	1 – Yes 2 – No 3 – Don't know	0 – No 1 – Yes
Self-reported gingivitis, GS	Have you during the last two years got the diagnosis mild gingivitis?	1 – Yes 2 – No 3 – Don't know	0 – No 1 – Yes
Self-reported periodontitis, PS	Have you during the last two years got the diagnosis severe gingivitis?	1 – Yes 2 – No 3 – Don't know	0 – No 1 – Yes

2.7 SAMINOR-2. Statistical analyses

Data management and statistical analyses were performed in the IBM SPSS-21 (116). The results of the findings shown in the tables were created in Microsoft Word 2010.

The start point of the statistical analysis began from an overview of the sample with an indication of the response rate in groups of interest. A special focus was on the response rate in the Sami and non-Sami language core areas and groups in different age and gender. To find out how these groups deviate from the mean response rate (27%), the function of cross-tabulation was used. A graphical output from the SPSS was applied to check outliers and compare a distribution of responses by age and gender with the perfect bell-shaped curve of normal distribution.

The Chi-square test was prioritized since it allows detecting if the statistical difference between affecting factors and outcome variables exists. It is especially valuable when we deal with two or more categories (113). Altogether 3 tables have been created, where the responses "Yes" and "No" in regards to CS, GS and PS were measured with the categories of GR, AGE, GH, DH, BMI, LN, ED, IN, DEN, FL, DM and PP. The cross-tabulation function gave a number of cases in each group; the option of continuity correction pointed out on the statistical differences between categories (horizontal column) while the focus is on the response "Yes" (vertical column).

Logistic regression for the same variables was performed in the univariate and multivariate modules; associations with the dental health related variables were explained by the values of Odds ratio, boundaries of the confident interval and p-value (113). The level of significance was set on 0.05 for both statistic analysis and logistic regression (117). A value odds ratio pointed out on the direction of association: OR = 1 – exposure does not affect outcome; OR>1 – higher odds of outcome; OR<1 – lower odds of outcome (118).

Hosmer-Lemeshov test accompanied each multivariate test evidencing if the model was worthwhile. A poor fit is indicated if a value is less than 0.05 and a good support – if more than 0.05 (117).

A value of Nagelkerke pointed out on the explanatory ability of variation in the dependent variable based on the model ranges.

2.8 SAMINOR-2, Ethics.

The Norwegian Data Protection Authority approved the Saminor project. Data collection and processing were permitted after obtaining signed informed consent from each participant enrolled in the survey.

Further sub-projects were obligated to apply to the Regional Committee for Medical and Health Research Ethics for Northern Norway (REK-Nord) (106). Besides, it was necessary to obtain a confirmation from the owner of the targeted sections in the questionnaires. All procedures have been completed and the required permissions obtained, (See Appendix).

2.9 SAMINOR-2-DENT.

The structure of this document and chosen variables reflect the goal to investigate conditions related to the oral health disorders. Following this idea, it has been decided to assign a special name for the sub-study of SAMINOR-2 with a prefix DENT. In this way, processing and analysis of data further in this document will be referred to the study SAMINOR-2-DENT.

3.0 Results

3.1 Characteristics of the study sample.

This chapter represents an overview of the response rate across the chosen groups of interest and a frequency of cases reported by the participants.

Table 4 shows the number of the selected and actually enrolled participants.

Table 4. Participation by municipalities (%, n) for SAMINOR-2. (106)

Counties – Sami language-core areas	Invited to participate in the study	Participants n	Response rate %
Karasjok	1796	505	28,1
Kautokeino	1857	527	28,1
Nesseby	568	151	26,6
Porsanger	2663	690	25,9
Tana	1885	544	28,9
Kåfjord	1409	361	25,6
Tysfjord	1252	245	19,6
Lavangen	609	152	24,9
Snåsa	820	288	35,1
Røyrvik	313	98	31,3
Total	13127	3561	27.4
Counties – Non-Sami language core areas			
Røros	403	116	28,8
Namsskogan	532	133	25.0
Narvik	1053	209	19,9
Grane	52	12	23,1
Hattfjelldal	656	193	29,4
Evenes	862	250	29.0
Skånland	1937	450	23,2
Lyngen	1902	534	28,1
Storfjord	1240	388	31,3
Kvænangen	810	204	25,2
Alta	12153	3236	26,6
Loppa	674	186	27,6
Kvalsund	625	169	27.0
Lebesby	856	224	26,2
Sør-Varanger	6300	1731	27,5
Total	29155	8035	26.4

There were no special and explicit peculiarities indicated in regard to the response rate among Sami and non-Sami municipalities. A divergence between the highest and the lowest response rate was seen in the both Sami and non-Sami language core areas; Snåsa 35.1%, Tysfjord 19.6% and Storfjord 31.3%, Narvik 19.9%, respectively. The mean response rates were approximately equal in these areas, 26.4% and 27.4 %, respectively.

Table 5 shows a response rate across the gender adjusted on the categories of age from less than 19 to 69 years. Women were more tend to participate in the SAMINOR-2 (31.2%) then men (22.8%). This contrast is aligned when approaching the older age 60-69, 36.3% and 34.5% respectively. The common trend for both genders is an incremental increase in the value of response rate from the younger to the older age.

Table 5. Participation by age and gender (%, n) for Saminor-2 (106)

Age groups	Male			Female		
	Population	Participants	Response rate (%)	Population	Participants	Response rate (%)
<19	966	100	10,4	844	173	20,5
20-29	3987	426	10,7	3610	785	21,8
30-39	3778	680	18,0	3586	965	26,9
40-49	4876	1096	22,5	4586	1548	33,8
50-59	4592	1339	29,2	4236	1594	37,6
60-69	4336	1508	34,5	3818	1386	36,3
Total	22565	5149	22,8	20680	6451	31,2

Figure 4 was obtained firstly, to assess the outliers. As it seen from the graph, the dispersion of the cases is more attributable to the males than to females. Secondly, the figure was compared to a perfect bell-shaped curve of the normal distribution. In that case, the female sample demonstrated a higher conformity than males, based on a visual assessment.

Figure 4. *Distribution of respondents according to age and gender.*
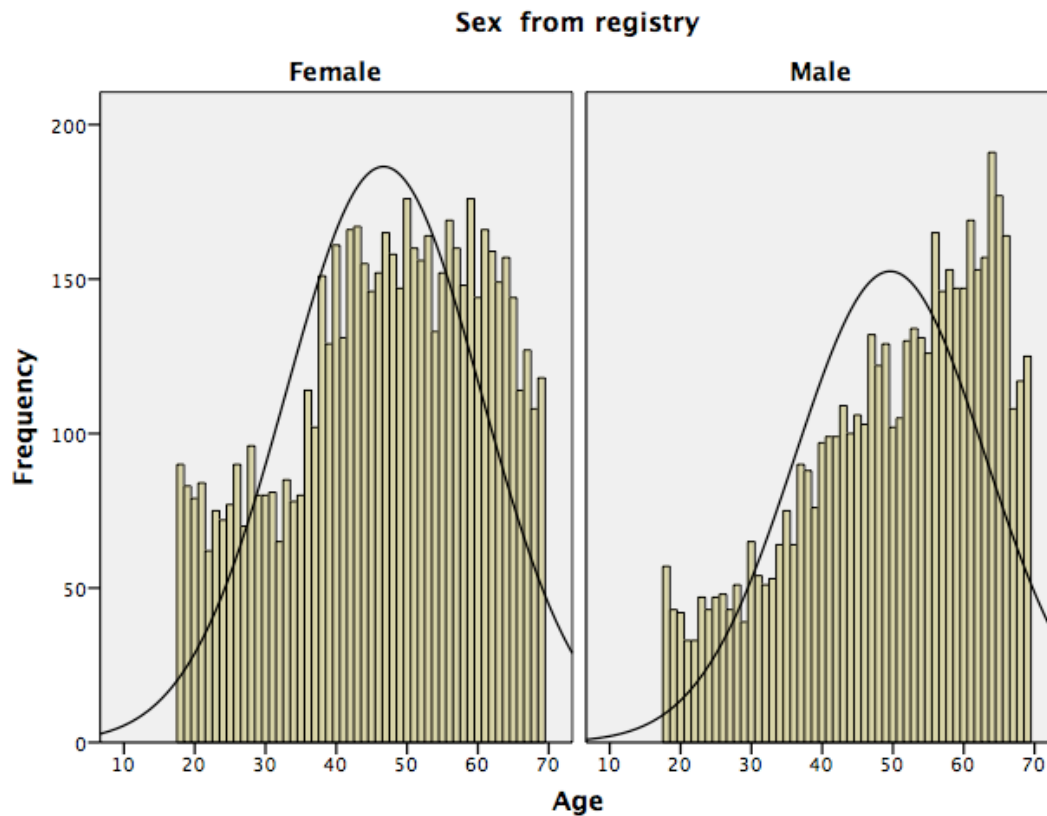
Table 6 gives an overview of the sample structure based on a frequency of the self-reported cases in regards to the conditions of interest and dental-health related disorders. The sample is presented crudely half-on-half in terms of age and gender, with a slight domination of female - 55.6% and younger age - 52.2%. Respondents reported somewhat more frequently negative dental health – 25.9% than negative general health 20.5%. Distribution of the cases among the variables reflected life conditions – such as BMI, education, income and area – was not equal through the categories. The highest amount of the participants was seen in the categories overweight, non-Sami language core area, medium income and 10-12 years of education; 38.9%, 69.3%, 33.5% and 26.6%, respectively. The frequency of self-reported health disorders was reported in the percentage for diabetes mellitus and psychological condition - 5.1% and 14.9%, respectively. Amount of participants with dentures was 10.7%; 29.5% reported that they use dental floss regularly, every day. All the variables – besides gender, age and area – included the group of "missing". The highest frequency of "missing" was detected for education – 10.1% and oral hygiene (dental floss) – 14.2%.

Table 6. *Structure of a sample (%, n) based on the frequency of cases.*

Total sample n=11 600.

Variables	Respondents % (n)	Missing % (n)
Gender		
Male	44.4 (5149)	No "missing"
Female	55.6 (6451)	
Age		
Younger (18-50 years)	52.2 (6051)	No "missing"
Older (51-69 years)	47.8 (5549)	
General health		
Negative	20.5 (2380)	3.5 (408)
Positive	76.0 (8812)	
Dental health		
Negative	25.9 (3000)	2.3 (268)
Positive	71.8 (8332)	
BMI		
Underweight (BMI: <18.5)	1.0 (119)	3.4 (394)
Normal weight (BMI: 18.5-24.9)	37.9 (4401)	
Overweight (BMI: 25-29.9)	38.9 (4508)	
Obesity (BMI: ≥30)	18.8 (2178)	
Area		
Non-Sami language core areas	69.3 (8035)	No "missing"
Sami language core areas	30.7 (3561)	
Education		
<7 yrs.	2.6 (301)	10.1 (1169)
7-9 yrs. (primary/lower sec. school)	12.6 (1456)	
10-12 yrs. (sec. school/crafts edu.)	26.6 (3090)	
13-15 yrs. (lower uni. /crafts edu.)	25.5 (2962)	
16-18 yrs. (higher uni. edu.)	22.6 (2622)	
Income		
Low income (<150 000-450 000)	31.9 (3695)	3.8 (443)
Medium income (451 000-750 000)	33.5 (3889)	
High income (>751000)	30.8 (3573)	
Diabetes		
No	88.4 (10252)	6.6 (761)
Yes	5.1 (587)	
Psychological problems		
No	79.0 (9161)	6.1 (710)
Yes	14.9 (1729)	
Dentures		
No	85.7 (9940)	3.6 (421)
Yes	10.7 (1239)	
Oral hygiene, Floss.		
Never or irregularly	56.3 (6532)	14.2 (1642)
Daily	29.5 (3426)	

Table 7 shows more detailed analyses of the related to the general and dental health self-reported disorders within the gender and age categories. Dentures are the most prevalent condition in the group of elderly male – 25.6%, however the difference between the groups of young and elderly is insignificant for both males and females.

Dentist diagnosed caries was reported more frequently in the group of males before 50 years – 50.5%. Dentist-diagnosed gingivitis and Diabetes were reported more frequently in the group of males older than 5o years 17.1% and 10.5%, respectively. Dentist diagnosed periodontitis is more prevalent in the group of females older than 50 years 7.3%. Psychological problem was reported more frequently in the group of females older than 50 years; significant difference between groups of young and elderly was detected for males only.

Table 7. Participation (%, n) by gender and age within the oral and general health self-reported disorders.

Self-reported disturbance	Male		Female		P-value
	18-50 yr.	51-69 yr.	18-50 yr.	51-69 yr.	Male/Female
Dentures	3.2 (74)	22.7 (603)	2.0 (71)	18.2 (491)	0.052/0.584
Dentist-diagnosed caries	50.5(1062)	49.6(1109)	47.0 (1599)	44.3 (976)	0.000/0.000
Dentist-diagnosed gingivitis	12.3 (248)	17.1 (351)	11.2 (357)	17.0 (360)	0.000/0.000
Dentist-diagnosed periodontitis	2.2 (44)	6.5 (132)	2.2 (70)	7.1 (147)	0.000/0.000
Diabetes	1.9 (44)	10.5 (267)	2.6 (91)	7.3 (185)	0.000/0.000
Psychological problem	12.1 (282)	10.7 (270)	22.1 (771)	15.9 (406)	0.000/0.130

3.2 Non-parametric statistic of the study sample.

This section presents a result of Chi-square test for the dental health-related variables – caries, gingivitis and periodontitis.

Table 8 shows a distribution of cases in regards to the dentist-diagnosed caries during last 2 years. When estimating caries with the response "Yes", the highest frequency of the occurrence of the cases is observed when responders are in the groups of male (50%), negative self-perceived general (52.5%) and dental health (62.9%), obesity (51.7%), Sami language core area (49.3%), education less than 7 years (51.6%), low income (50.6%), irregular use of dental floss (49%), self-reported Diabetes (53.7%) and psychological problems (52.6%). The proportion of cases in these groups is statistically different when comparing to other categories in respective groups. The age and dentures have no significant difference between groups.

From Table 8 it is possible to see that the respondents who reported positively in regards to the dentist-diagnosed gingivitis are more common in the group of older age (17%), negative self-perceived general (18.0%) and dental health (23.2%), underweight (17.4%), education less than 7 years (17.5%), low income (17.1%), dentures (18.5%), self-reported Diabetes (20.8%) and psychological problems (18.1%). There is statistical difference detected in these groups when comparing to other categories in the respective groups. Gender, language core area and dental floss have no significant difference between the groups.

Table 8 gives an overview of cases when the analysis is focused on the positive response in regard to the dentist-diagnosed periodontitis. The highest frequency is seen if the respondents are in the group of older age (6.8%), negative self-perceived general (7.6%) and dental health (13.2%), Sami language core area (5.5%), education less than 7 years (6.5%), low income (5.9%), dentures (16.0%), regularly use of the dental floss (4.7%), self-reported Diabetes (11.5%) and psychological problems (6.5%). Statistical difference between categories in corresponding groups is detected. The groups of older age and BMI have no significant difference between the groups.

Table 8. *Chi-square test for independence. The distribution of cases (%, n) in regards to the self-report about dentist-diagnosed caries, gingivitis and periodontitis within a set of affecting factors.*

Variables/ p-value	Caries	P	Gingivitis	P	Periodontitis	P
Gender						
Male	50.0 (2171)		14.7 (599)		4.3 (176)	
Female	45.9 (2575)	0.000	13.5 (717)	0.091	4.1 (217)	0.613
Age						
Younger (18-50 yrs.)	48.0 (2661)		11.6 (605)		2.2 (114)	
Older (51-69 yrs.)	47.4 (2085)	0.553	17.0 (711)	0.000	6.8 (279)	0.000
General health						
Negative	52.5 (1002)		18.0 (308)		7.6 (131)	
Positive	46.5 (3596)	0.000	13.1 (968)	0.000	3.3 (241)	0.000
Dental health						
Negative	62.9 (1400)		23.2 (462)		13.2 (269)	
Positive	43.3 (3310)	0.000	11.5 (841)	0.000	1.6 (117)	0.000
BMI						
Underweight (BMI: <18.5)	47.8 (44)		17.4 (15)		4.5 (4)	
Normal weight (BMI: 18.5-24.9)	45.0 (1727)		13.3 (483)		3.7 (133)	
Overweight (BMI: 25-29.9)	48.3 (1866)		13.5 (496)		4.5 (166)	
Obesity (BMI: ≥30)	51.7 (960)	0.000	16.4 (282)	0.010	4.3 (74)	0.311
Language core area						
Specific Sami language districts	49.3 (1444)		13.7 (909)		3.7 (243)	
Non-specific Sami language districts	47.0 (3302)	0.039	14.8 (407)	0.144	5.5 (150)	0.000
Education						
<7 yrs.	51.6 (133)		17.5 (42)		6.5 (16)	
7-9 yrs. (primary/lower sec. school)	46.4 (474)		17.3 (169)		6.1 (59)	
10-12 yrs. (sec. school/crafts edu.)	50.8 (1315)		15.8 (384)		5.7 (137)	
13-15 yrs. (lower uni. /crafts edu.)	48.1 (1279)		13.2 (331)		3.5 (88)	
16-18 yrs. (higher uni. edu.)	45.5 (1103)	0.002	11.9 (272)	0.000	2.5 (57)	0.000
Income in K. NOK						
Low income (<150 000-450 000)	50.6 (1497)		17.1 (472)		5.9 (162)	
Medium income (451 000-750 000)	48.4 (1654)		13.7 (442)		4.8 (154)	
High income (>751 000)	43.9 (1448)	0.000	11.3 (365)	0.000	2.2 (68)	0.000
Dentures						
No	47.7 (4246)		13.6 (1146)		3.0 (254)	
Yes	47.1 (373)	0.752	18.5 (137)	0.000	16.0 (127)	0.000
Hygiene, dental floss						
Irregularly	49.0 (2918)		13.7 (770)		3.1 (176)	
Regularly	46.6 (1403)	0.030	14.0 (403)	0.716	4.7 (132)	0.000
Diabetes						
No	47.3 (4231)		13.5 (1147)		3.7 (312)	
Yes	53.7 (232)	0.010	20.8 (80)	0.000	11.5 (45)	0.010
Psychological problems						
No	46.6 (3707)		13.2 (1002)		3.7 (276)	
Yes	52.6 (782)	0.000	18.1 (246)	0.000	6.5 (88)	0.000

3.3 Logistic regression.

A logistic regression was conducted to reveal the effect of GR, AGE, GH, DH, BMI, LN, ED, IN, DEN, FL, DM and PP on the likelihood that respondents have dental health-related disorders CS, GS and PS. Processing of variables was implemented in two approaches. Firstly, the univariate analysis tested each potential predictor separately; second, all the variables with significant p-value were included into the multivariate module.

Table 9. A multivariate logistic regression for dependent variable Caries found out that males were 16% more likely to report caries experience as compared to females. Respondents who had good self-perceived dental health were 59% less likely to report caries experience as compared to the group with poor self-perceived dental health. Reporting high income (451000-750000 NOK) decreased the odds by 15% for reporting experience with caries as compared to those who had low income (<150000-450000 NOK). Individuals with psychological problems were 19% more likely to report caries experience as compared to those who did not report psychological problems.
The Hosmer and Lemeshov test indicated a good support of the model – 0.133. The Nagelkerke test explained ≈5% of variation in the dependent variable Caries – 0.049.

Table 10. A multiply logistic regression for dependent variable Gingivitis detected that the age older than 50 increased the odds by 50% for reporting experience with gingivitis as compared to respondents in the age younger than 50 years. Respondents who had good self-perceived dental health were 55% less likely to report gingivitis experience as compared to the group with poor self-perceived dental health. Reporting high income (>750000 NOK) decreased the odds by 24% for reporting gingivitis experience as compared to those who had low income (<150000-450000 NOK). Additionally, medium income (451000-750000 NOK) reduced the odds of reporting gingivitis by 15% as compared to those who had low income (<150000-450000 NOK). Individuals with psychological problems were 34% more likely to report caries experience as compared to those who did not report psychological problems.

The Hosmer and Lemeshov test indicated a good support of the model – 0.851. The Nagelkerke test explained ≈5% of variation in the dependent variable Gingivitis – 0.048.

Table 11. A logistic regression for dependent variable periodontitis identified that the age older than 50 increased the odds by 116% for reporting experience with periodontitis as compared to respondents in the age younger than 50 years. Respondents who had good self-perceived dental health were 88% less likely to report periodontitis experience as compared to the group with poor self-perceived dental health. Reporting high income (>750000 NOK) decreased the odds by 24% for reporting experience with periodontitis as compared to those who had low income (<150000-450000 NOK). Individuals with psychological problems were 81% more likely to report periodontitis experience as compared to those who did not report psychological problems. Presence of dentures increased the odds by 132% for reporting experience with periodontitis as compared with those who did not reported dentures. Daily use of dental floss increased the odds by 92% for reporting experience with periodontitis as compared with those who used dental floss irregularly or never. The Hosmer and Lemeshov test indicated a good support of the model – 0.850. The Nagelkerke test explained ≈22% of variation in the dependent variable periodontitis – 0.225

Table 9. *Logistic regression. The effect of gender, age, self-perceived general and dental health, language core areas, BMI, education, Income, Diabetes, psychological problems, dentures and dental floss on the likelihood that participants report about dentist-diagnosed caries during last 2 years.*

Caries	Univariate			Multivariate*, **		
	OR	95% CI	P	OR	95% CI	P
Gender						
Female	Reference			Reference		
Male	1.17	(1.08-1.27)	<0.001	1.16	(1.08-1.32)	0.001
AGE						
Younger (18-50 yrs.)	Reference					
Older (51-69 yrs.)	0.97	(0.90-1.05)	0.540			
General health						
Not so good or poor	Reference			Reference		
Good or very good	0.78	(0.71-0.86)	<0.001	0.96	(0.85-1.08)	0.559
Dental health						
Not so good or poor	Reference			Reference		
Good or very good	0.45	(0.40-0.49)	<0.001	0.41	(0.37-0.47)	<0.001
Language in areas						
Non-Sami language	Reference			Reference		
Sami language	1.09	(1.00-1.19)	0.037	1.05	(0.95-1.15)	0.316
BMI						
Underweight (BMI: <18.5)	Reference					
Normal weight (BMI: 18.5-24.9)	0.89	(0.59-1.35)	0.596			
Overweight (BMI: 25-29.9)	1.01	(0.67-1.54)	0.930			
Obesity (BMI: ≥30)	1.16	(0.76-1.77)	0.472			
Education						
<7 yrs.	Reference					
7-9 yrs.(primary/lower sec. school)	0.81	(0.61-1.06)	0.138			
10-12 yrs. (sec. school/crafts edu.)	0.97	(0.75-1.25)	0.826			
13-15 yrs. (lower uni. /crafts edu.)	0.87	(0.67-1.12)	0.288			
16-18 yrs. (higher uni. edu.)	0.78	(0.60-1.01)	0.066			
Gross income						
Low income (<150 000-450 000)	Reference			Reference		
Medium income(451 000-750 000)	0.91	(0.83-1.01)	0.888	Reference		
High income (>751 000)	0.76	(0.69-0.84)	<0.001	0.85	(0.78-0.94)	0.001
Diabetes						
No	Reference			Reference		
Yes	1.29	(1.06-1.57)	0.009	1.13	(0.89-1.42)	0.303
Psychological problems						
No	Reference			Reference		
Yes	1,27	(1.13-1.42)	<0.001	1.19	(1.05-1.35)	0.007
Dentures						
No	Reference					
Yes	0.97	(0.84-1.12)	0.724			
Hygiene skills (floss)						
Never or irregularly	Reference			Reference		
Daily	0.90	(0.83-0.99)	0.029	0.99	(0.90-1.09)	0.931

* Hosmer and Lemeshov test – 0.133

** Nagelkerke test – 0.049

Table 10. *Logistic regression. The effect of gender, age, self-perceived general and dental health, language core areas, BMI, education, Income, Diabetes, psychological problems, dentures and dental floss on the likelihood that participants report about dentist-diagnosed gingivitis during last 2 years.*

Gingivitis	Univariate			Multivariate*,**		
	OR	95% CI	P	OR	95% CI	P
Gender						
Female	Reference					
Male	1.10	(0.98-1.24)	0.086			
AGE						
Younger (18-49 yrs.)	Reference			Reference		
Older (50-69 yrs.)	1.56	(1.39-1.75)	<0.001	1.50	(1.31-1.72)	<0.001
General health						
Not so good or poor	Reference			Reference		
Good or very good	0.68	(0.59-0.79)	<0.001	0.94	(0.79-1.11)	0.482
Dental health						
Not so good or poor	Reference			Reference		
Good or very good	0.42	(0.37-0.48)	<0.001	0.45	(0.39-0.52)	<0.001
Language in areas						
Non-specific Sami language	Reference					
Specific Sami language districts	1.10	(0.97-1.24)	0.136			
BMI						
Underweight (BMI: <18.5)	Reference					
Normal weight (BMI: 18.5-24.9)	0.72	(0.41-1.27)	0.264			
Overweight (BMI: 25-29.9)	0.74	(0.42-1.30)	0.300			
Obesity (BMI: ≥30)	0.92	(0.52-1.64)	0.800			
Education						
<7 yrs.	Reference			Reference		
7-9 yrs.(primary/lower sec. school)	0.98	(0.68-1.43)	0.946	Reference		
10-12 yrs. (sec. school/crafts edu.)	0.88	(0.62-1.25)	0.490	Reference		
13-15 yrs. (lower uni. /crafts edu.)	0.71	(0.50-1.02)	0.064	Reference		
16-18 yrs. (higher uni. edu.)	0.63	(0.44-0.90)	0.012	0.91	(0.77-1.07)	0.268
Gross income						
Low income (<150 000-450 000)	Reference			Reference		
Medium income (451 000-750 000)	0.77	(0.62-0.89)	<0.001	0.85	(0.72-0.99)	0.042
High income (>751 000)	0.62	(0.53-0.72)	<0.001	0.76	(0.64-0.90)	0.002
Diabetes						
No	Reference			Reference		
Yes	1.68	(1.30-2.17)	<0.001	1.30	(0.97-1.74)	0.072
Psychological problems						
No	Reference			Reference		
Yes	1,45	(1.24-1.69)	<0.001	1.34	(1.12-1.60)	0.001
Dentures						
No	Reference			Reference		
Yes	1.44	(1.18-1.75)	<0.000	0.83	(0.65-1.06)	0.143
Hygiene skills (floss)						
Never or irregularly	Reference					
Daily	1.02	(0.90-1.16)	0.692			

* Hosmer and Lemeshow Test – 0.851

** Nagelkerke test – 0.048

Table 11. *Logistic regression. The effect of gender, age, self-perceived general and dental health, language core areas, BMI, education, Income, Diabetes, psychological problems, dentures and dental floss on the likelihood that participants report about dentist-diagnosed periodontitis during last 2 years.*

Periodontitis	Univariate			Multivariate*, **		
	OR	95% CI	P	OR	95% CI	P
Gender						
Female	Reference					
Male	1.06	(0.86-1.29)	0.577			
AGE						
Younger (18-48 yrs.)	Reference			Reference		
Older (50-69 yrs.)	3.22	(2.62-4.08)	<0.001	2.16	(1.61-2.89)	<0.001
General health						
Not so good or poor	Reference			Reference		
Good or very good	0.41	(0.33-0.51)	<0.001	0.90	(0.66-1.21)	0.503
Dental health						
Not so good or poor	Reference			Reference		
Good or very good	0.10	(0.08-0.13)	<0.001	0.12	(0.92-0.16)	<0.001
Language in areas						
Non-specific Sami language	Reference			Reference		
Specific Sami language districts	1.51	(1.22-1.86)	<0.001	1.24	(0.94-1.63)	0.114
BMI						
Underweight (BMI: <18.5)	Reference					
Normal weight (BMI: 18.5-24.9)	0.80	(0.29-2.21)	0.671			
Overweight (BMI: 25-29.9)	0.99	(0.36-2.75)	0.999			
Obesity (BMI: ≥30)	0.94	(0.33-2.64)	0.913			
Education						
<7 yrs.	Reference			Reference		
7-9 yrs. (primary/lower sec. school)	0.93	(0.53-1.66)	0.827	Reference		
10-12 yrs. (sec. school/crafts edu.)	0.86	(0.50-1.47)	0.598	Reference		
13-15 yrs. (lower uni. /crafts edu.)	0.52	(0.30-0.91)	0.023	0.93	(0.67-1.29)	0.676
16-18 yrs. (higher uni. edu.)	0.36	(0.20-0.64)	0.001	0.83	(0.57-1.21)	0.347
Gross income						
Low income (<150 000-450 000)	Reference			Reference		
Medium income (451 000-750 000)	0.79	(0.63-0.99)	0.044	1.08	(0.80-1.46)	0.613
High income (>751 000)	0.35	(0.26-0.46)	<0.001	0.63	(0.43-0.92)	0.019
Diabetes						
No	Reference			Reference		
Yes	3.38	(2.43-4.71)	<0.001	1.56	(0.98-2.47)	0.060
Psychological problems						
No	Reference			Reference		
Yes	1.82	(1.42-2.33)	<0.001	1.81	(1.30-2.51)	<0.000
Dentures						
No	Reference			Reference		
Yes	6.00	(4.83-7.61)	<0.001	2.32	(1.65-3.26)	<0.001
Hygiene skills (floss)						
Never or irregularly	Reference					
Daily	1.52	(1.20-1.91)	<0.000	1.92	(1.46-2.52)	<0.000

*Hosmer and Lemeshow Test – 0.850

** Nagelkerke test – 0.225

4.0 Discussion

4.1 Main results.

The SAMINOR-2-DENT study has proven that:

1. The factors of gender, self-perceived dental health, income and psychological problems affect significantly the likelihood that participants report <u>caries</u> experience during the last 2 years as compared to the opposite group, when controlling in the multivariate module.

2. The factors of age, self-perceived dental health, income and psychological problems affect significantly the likelihood that participants report <u>gingivitis</u> experience during the last 2 years as compared to the opposite group, when controlling in the multivariate module.

3. The factors of age, self-perceived dental health, income, psychological problems, dentures and dental floss affect significantly the likelihood that that participants report <u>periodontitis</u> experience during the last 2 years as compared to the opposite group, when controlling in the multivariate module.

4.2 Main findings.

According to the conducted analyses for SAMINOR-2-DENT, it has been identified that males were 16% more likely to report caries experience during last 2 years as compared to females. Based on the knowledge obtained from external sources, I expected to see that it is not males but females that are in the group of risk, because of the predisposing factors affecting females – earlier eruption, pregnancy, more frequent food consumption and hormonal fluctuations (21). I did not find a plausible explanation of such pattern of association and concluded that this topic should be elaborated further.

Ageing was detected in the SAMINOR-2-DENT as a predictor of periodontal diseases. Effect of age is widely discussed in the background literature, but the findings suggested that age alone is not a major factor. It is preferably to consider the age together with other factors in the multivariate analysis (119). The result of multivariate analysis in SAMINOR-2-DENT reveals that gingivitis and periodontitis

are more likely to be reported by 50% and 116% respectively if the age of responders is more than 50 years compared to the group of age less than 50 years.

Aging affects periodontium negatively because of the following three factors - alteration of the balance between osteoblast and osteoclast, increase of cytokines secretion and systemic endocrine alteration (120). There is some evidence which reflecting these findings. For instance, Fransson et al. in 1996 found that gingivitis has more pronounced manifestation also Velden in 1984 suggested that periodontitis tends to be more prevalent among elderly than young (121, 122). This evidence is not directly applicable for the result of the SAMINOR-2-DENT study but they can indirectly explain the detected age difference.

The multivariate logistic regression indicated that positive self-estimation of dental health decreases the probability of reporting the experience with gingivitis by 55% and periodontitis by 88% in comparison to the group with negative self-perceived dental health.

The percentage of respondents who estimated themselves as being in good dental health was 71.8% in the SAMINOR-2-DENT. The study conducted in Norway in 2004 by Holst et al. reported that 68% of respondents from the sample of 2471 persons estimated their dental health as good enough (123). The principle of data collection for this study was similar with SAMINOR-2-DENT.

Vered and Sgan-Cohen in 2003 discussed the idea that evaluation based on the self-perception is not precise tool in regards to caries and periodontal pathology. In reality, respondents have higher level perception of health but lower level perception of pathology (124). This finding referred me to the concept of social desirability bias, which presumably could take a place in the SAMINOR-2-DENT study. Participants could overestimate health and underestimate disease in order to create a more favourable picture.

This fact encouraged me to be very careful when it comes to explanation of the association between self-perceived dental health and oral-related disorders. It has been found out that very few studies explained directly an association in the way, which corresponds to the aim and style of SAMINOR-2-DENT. Nonetheless, some arguments can be applicable to understand how self-perceived dental health and oral health-related disorders may interact.

Richmond et al. in 2007 suggested that gingivitis and root caries significantly impact self-rated oral health (125). The authors used variables similar to the SAMINOR-2-DENT but the way of association was set in the opposite direction.

The questionnaire design was used for the study conducted in Scandinavia by Ekback et al. in 2007 (126). They revealed that responders were less satisfied with their oral health if they reported - among others - about dental-related problems: had missing teeth, experienced a toothache, bad breath and problem with chewing. This result was obtained from the sample of 65-years-olds in Norway and Sweden. Dahl et al. released a result of the study among 20-80-year-old Norwegians in 2011 (127). They suggested after multivariate analysis that – "Self-rated oral health, frequency of dental visits, number of teeth, age and sex were significantly associated with the prevalence of having problems and frequent problems". The result was assessed by the measures of Oral Health Impact Profile (OHIP)- 14 (127).

Such analyses provide a valuable insight into the issue of self-perceived dental health and a possible way of association. But it still does not give a clear answer on the subject of SAMINOR-2-DENT. The possibility of self-perceived dental health to predict dental health-related disorders should be worked out further.

Marmot et al. in 2012 speculated that socio-economic position (SEP) in the society is a factor affecting the chance of development of pathological conditions of health (128). The SEP is a general definition including – among others – education and income. I assumed if Marmot et al. described these factors as important ones for general health, it might be also the same pattern for the oral health. To support this idea I used external sources of literature and compared it to the result obtained after the logistic regression. The result of multivariate analysis SAMINOR-2-DENT revealed that the participants who reported annual income >751000 NOK were 15% less likely to report an experience with caries, 24% - with gingivitis and 37% - with periodontitis. In addition those who earn 451000-750000 NOK were also 15% less likely to report an experience with gingivitis, compared to those who reported about low income for all cases. Schwendicke et al. in 2015 conducted a meta-analysis where they concluded that the odds ratio of having caries was significantly higher among those who were in the group of lower income and lower education (129). The study

conducted in 2009 by Bernabe et al. suggested the opposite that - "Income measures were not related to either dental caries or dental care levels" (130). These statements were formulated based on the clinical examination and the value of DMFT that makes it impossible to compare with SAMINOR-2-DENT which has a result based on the self-report.

The problem of heterogeneity was also relevant for the comparison of SAMINOR-2-DENT and other studies in regards to the periodontal pathology and association with income. Borrell et al. in 2006 concluded that level of income and education are associated significantly with periodontitis (131). The method of data collection for this study is based on the clinical assessment of attachment loss and pocket depth. That is more reliable method if comparing to the self-report as it has been done in SAMINOR-2-DENT. Hence, I can admit that in spite of the numerous of studies with the issue of socio-economic factors and dental health disorders, the result of SAMINOR-2-DENT cannot be compared properly to other studies, because of the different designs. In other words, in a case of the presence of clinical survey and questionnaire, we deal with objective and subjective assessment, which presumably are not comparable.

In the SAMINOR-2-DENT study 14.9% of responders reported positively in regard to the presence of self-reported psychological problems. This condition has been detected as a significant predictor of the self-reported caries, gingivitis and periodontitis multivariate analyses. Those who reported positively about psychological problems were 19% more likely to report caries experience, 34% - gingivitis and 81% - periodontitis, when comparing to the group without psychological problems.

I did not expect to find an association between medical conditions, which belong to different part of the medical field and logically have nothing in common. The search of relevant literature did not give me comparable studies as well. However, in spite of this challenge, there is a possible explanation why such association may exist.

In terms of caries, the main role is played by a neglect of everyday hygienic routine and an increase of consumption of sugar-contained food, because of the oppressed mood for the first one and the low level of serotonin in blood for the second one (132, 133).

In regards to periodontal diseases, the main impact goes due to the change in neuroendocrine system and immune response for those who experiencing stress (134, 135) The impact of lack of hygiene is also discussed. The individuals with depression or stress are tending to ignore proper hygiene (136).

In this way, I can assume that the result of SAMINOR-2-DENT for psychological problems may be explained by the indirect influence on the oral diseases through the change of behaviour and alteration of the immune response.

A variable denture was constructed based on the self-report in regards to the presence of dentures in the mouth. The result revealed that those who reported dentures were 132% more likely to report periodontitis experience. But there was no specification in the questionnaire - what type of the dental construction should be understood under this formulation. I assumed that participants could consider both fixed and removable prosthodontics construction as dentures and that certainly changes the reliability of the result. In spite of this limitation, I searched literature to reveal a pattern of association between dentures and periodontitis. There were shortages of studies, which operate with statistical magnitudes but some arguments can be applicable.

Zlatarik et al. in 2002 suggested that removable partial dentures deteriorate periodontal status of abutment teeth compared to non-abutment. The analysis indicated significant difference between these groups, when it was measured by the plaque, gingival, calculus and Tarbet indexes as well as probing depth, tooth mobility and gingival recession (137). They concluded also that the design of removable dentures plays an important role in the state of periodontal disorders.

Ellakwa in 2012 summarised the most important factors affecting the progress of periodontal deceases in terms of dentures. He speculated that these factors are an increase of Streptococcus Mutans contamination, favourable environment for the formation of plaque and transmission of excessive forces (138). Such factors create an adverse effect and promote a course of periodontal diseases.

A plausible way of association with periodontitis can be also explained in the case when the respondents considered a fixed prosthodontics as the aim of the question.

Yung-Ting Hsu et al. in 2015 described the relationship between prosthodontics and periodontics as intimate and inseparable. They suggested that maintenance of biological width, proximal relationship, localisation of restoration margin, trauma

from occlusion and the method of gingiva retraction are important factors when assessing periodontal health after the prosthodontics treatment (139). In a case if some association detected – as for SAMINOR-2-DENT – I guess, we can apply to these factors to understand the way of association.

In the SAMINOR-DENT-2 study 29.5% of responders reported that they use dental floss regularly (every day). The American Dental Association concluded that 7 of 10 people or 69% use the dental floss every day in the USA (140). Perhaps, the higher frequency of the use of floss in the USA is a result of the cultural differences and different approaches to the dental-related behaviour compared to the sample in SAMINOR-2-DENT. Result of SAMINOR-2-DENT suggested that the respondents who reported a daily use of dental floss were 92% more likely to report periodontitis experience as compared to those who use dental floss irregularly or never. This fact is greatly surprising because it goes contrary to the widely accepted rules of everyday hygienic routine. I assume, that the individuals with periodontal diseases have a very susceptible gingiva regarding to mechanical pressure. The use of dental floss is connected to mechanical exposure. Presumably, the intensive use of dental floss causes mechanical irritation and following deterioration of periodontal status. This assumption should be tested further.

An overview of existing evidence pointed out that the role of dental floss in daily hygiene routine may be overestimated in respect to the dental deceases as general and periodontitis specifically. The Cochrane official source describes the role of dental floss and provides some evidence in favour of gingivitis, weak evidence regarding reduction in plaque and no evidence is reported for the effectiveness for prevention of caries (99). As European 11-th workshop in periodontology concluded – "No evidence flossing benefits patients with gingivitis or periodontitis." (141).

4.3 Limitation of the study.

There are several factors detected, which affect negatively both internal and external validity of the study. It concerns the study design, conduction of measures and processing of data.

Response rate.

The risk of <u>selection bias</u> was estimated as high for the SAMINOR-2-DENT study because of relatively low response rate – 26.9% that in its turn weakens an ability of this sample to represent the whole population in the region. This rate was much lower if compared to other medical studies. An average response rate was set on 72.1% among 210 health-related publications analysed by Sitzia and Wood in 1994 (142). Although the mean response rate for the mail surveys specifically was slightly lower – 66.5%, but it is still more than 2 times higher than in the SAMINOR-2-DENT.

The response rate for the SAMINOR-1 conducted earlier in 2003-2004 is also higher – 60.6% (143). Surprisingly, this survey has a maximum homogeneity with SAMINOR-2 in accordance to style, purposes and tools. Edwards et al. suggested the possible explanation in 2002 when they concluded that such differences − among others − might be a result of the length of questionnaires (144). Indeed, SAMINOR-1 questionnaires consisted of 5 pages against 8 pages for SAMINOR-2.

Another factor, which presumably can negatively influence the response rate, is the factor of age. Harrison et al. in 2002 found that the response rate increases with age. Younger (18-45 years) are less prone to respond than elderly (> 65 years), 46.5% against 82.5%, respectively (145). The same pattern is reflected in the Saminor-2 – the response rate increases gradually from the age 19 to the age 69 and the weakest response rate is in the group before 30 years. It is wise to mention that SAMINOR-1 did not invite people before 30 years and involved a sample after 69 years (143). That in its turn can be a reason of relatively high response rate (60.6%) for SAMINOR-1 and low for SAMINOR-2 (26.9%).

A gradual increase of the response rate from the young to the elderly is typical for both genders but an average value of response for entire groups is not the same; 22,8% for males against 31.2% for females. This uneven is not enough discussed in the literature. Thus, it is wise to assume that there is some factor in the SAMINOR-2-DENT study specifically, which affect a difference between genders in respect to the response rate. A more detailed analysis indicated that the most unreliable are the groups of males < 19 and 20-29 years, which gave a response rate 10.4% and 10.7%, respectively. These groups show more than 10% reduction of the response rate when comparing to a corresponding group of women. Further, this inequality weakens

while approaching the more elderly groups and becomes a minimal in the age 60-69 - male (34.5%) and female (36.3%).

Missing.

The magnitude of the missing cases is shown in the table 6. I paid attention that some categories such as gender and age do not have a missing. But, the value of missing for other categories with the question regarding health and pathological conditions was up to 7%. The value of missing for the oral hygiene (dental floss) was even higher – 14.2%. I assumed that such missing might be the result of cognitive factors. People did not understand the question or preferred to ignore it because they found it inappropriate for some reason. Variable education has also a high value of missing – 10.1% but this value was obtained as a result of the modification of data. At the start of analysis I decided to exclude the group of education higher than 18 years because of the potential high risk of the <u>response bias.</u>

Formulation and construction of variables

Analysis of the variables describing pathology in gingiva indicated possible inaccuracy, when it comes to the explanation of concepts in English and Norwegian. The questions regarding the gum disease were formulated in Norwegian and asked about "Alvorlig og mild tannkjøttsbetennelse" that has more likely been understood as severe and mild gum inflammation. However, the label of question in the SPSS refers to the English version and gives the medical terms – severe and mild <u>gingivitis.</u> The possibility of respondents to distinguish different manifestation and memorise precisely diagnosis they got from the dentist was sceptically speculated, because of a complex diagnostic of the different types of gingivitis (146). Taking that into account, it has been decided that it is more logical to assume that severe gum inflammation corresponds to periodontitis and mild gum inflammation – to gingivitis. In this manner, the variables <u>self-reported gingivitis</u> and <u>self-reported periodontitis</u> have been included in the analysis.

Questionnaire design.

When gathering data for the comparison, I faced the problem that very few studies for each topic had the same or at least relatively familiar design in comparison to the

SAMINOR-2-DENT. Health related disorders are measured more often by clinical examination but my study has a design of questionnaire. Hence, some issues cannot be comparable at all.

Another weak side of the questionnaire is a necessity of recall to memory of past events as it was with caries, gingivitis and periodontitis in SAMINOR-2-DENT, when they were asked about experience with these disorders during last 2 years. Participants gave answers based on subjective personal estimation and memory. Besides, there could be questions, which were considered as very sensitive or not appropriate. Based on these facts, the problem of potential recall bias has a topicality for SAMINOR-2-DENT.

4.4 Study contributions and future initiatives.

SAMINOR-2-DENT study, as it was discussed above, does not have a high enough external validity because of a special study design (questionnaire). Nonetheless, I confirmed that socioeconomic position, health-related conditions, physiological parameters, and hygienic behaviour predict the likelihood of the report in regards to the dentist-diagnosed dental disorders (more detailed in the paragraph 3.3). The results of other available studies did not fully correspond to SAMINOR-2-DENT and some variation took place. That encourages me to suggest that this topic is not elaborated yet, especially when it comes to the questionnaire survey.

A special interest should be aimed also at the problem of dental-health disadvantages in the North part of Norway and indigenous people specifically. The SAMINOR-2-DENT study disclosed this topic partially. Because of the restricted number of available data I did not analyse sample on the subject of ethnicity. I assume that there should be some factors, which are associated to dental health of the people who are ethnically Sami. More researches need to be conducted in order to gain knowledge about dental health in the framework of SAMINOR project or other relevant studies.

4.5 Conclusion.

In the SAMINOR-2-DENT study, the data gathered from the sample of 11600 representatives was analysed on the subject of factors associated with an incidence of dental diseases during last 2 years, based on the self-report.

The multivariate logistic regression analysis revealed that:

1. Male gender was significantly associated with an increased probability of reporting caries.

2. The age older than 50 years was significantly associated with an increased probability of reporting gingivitis and periodontitis.

3. Reporting of good self-perceived dental health was significantly associated with a decreased probability of reporting caries, gingivitis and periodontitis.

4. High annual income (>751000 NOK) was significantly associated with a decreased probability of reporting caries, gingivitis and periodontitis. Additionally, medium income (451000-750000 NOK) was significantly associated with a decreased probability of reporting gingivitis.

6. Reporting about psychological problems was significantly associated with an increased probability of reporting caries, gingivitis and periodontitis.

7. Having of dentures was significantly associated with an increased probability of reporting periodontitis.

8. Regular daily use of dental floss was significantly associated with an increased probability of reporting periodontitis.

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Appendix 1

REK
REGIONALE KOMITEER FOR MEDISINSK OG HELSEFAGLIG FORSKNINGSETIKK

Region:	Saksbehandler:	Telefon:	Vår dato:	Vår referanse:
REK nord	Monika Rydland Gaare	77620756	04.06.2015	2015/595/REK nord
			Deres dato:	**Deres referanse:**
			01.06.2015	

Vår referanse må oppgis ved alle henvendelser

Tordis A Trovik
Det helsevitenskapelige fakultet

2015/595 Aspekter av selvrapportert tannhelse i den voksne befolkningen i 25 kommuner med samisk og norsk bosetning i Finnmark, Troms, Nordland og Trøndelag

Forskningsansvarlig: Senter for samisk helseforskning endres til Institutt for samfunnsmedisin
Prosjektleder: Tordis A Trovik

Vi viser til søknad om prosjektendring av 01.06.2015 for ovennevnte forskningsprosjekt vedrørende endring av forskningsansvarlig institusjon i henhold til komiteens vedtak av 11.05.2015.

Etter fullmakt er det fattet slik

vedtak
Med hjemmel i helseforskningsloven § 11 og forskningsetikkloven § 4 godkjennes prosjektendringen.

Endringen godkjennes under forutsetning av at prosjektet gjennomføres slik det er beskrevet i søknaden, endringssøknaden, oppdatert protokoll og de bestemmelser som følger av helseforskningsloven med forskrifter.

For øvrig gjelder de vilkår som er satt i forbindelse med tidligere godkjenning av prosjektet.

Sluttmelding og søknad om prosjektendring
Prosjektleder skal sende sluttmelding på eget skjema senest et halvt år etter prosjektslutt, jf. helseforskningslovens § 12. Dersom det skal gjøres vesentlige endringer i forhold til de opplysninger som er gitt i søknaden må prosjektleder sende søknad om prosjektendring til REK, jf. helseforskningslovens § 11.

Klageadgang
Du kan klage på komiteens vedtak, jf. forvaltningslovens § 28 flg. Klagen sendes til REK nord. Klagefristen er tre uker fra du mottar dette brevet. Dersom vedtaket opprettholdes av REK nord, sendes klagen videre til Den nasjonale forskningsetiske komité for medisin og helsefag for endelig vurdering.

Med vennlig hilsen

May Britt Rossvoll
sekretariatsleder

Monika Rydland Gaare
seniorkonsulent

Kopi til: *ann.ragnhild.broderstad@uit.no; magritt.brustad@uit.no*

Appendix 2

SAMINOR 2
HELSE- OG LEVEKÅRSUNDERSØKELSE

Forespørsel om deltakelse i forskningsprosjektet SAMINOR 2

Bakgrunn og hensikt
Dette er et spørsmål til deg om å delta i et forskningsprosjekt for å få mer kunnskap om helse, sykdom og levekår i områder med samisk og norsk bosetting. Du som deltar i denne undersøkelsen vil bli bedt om å svare på et spørreskjema om helse og levekår.

Du er invitert til å være med i denne studien fordi du er i alderen 18-69 år og bosatt i en av kommunene som er valgt ut til å inngå i undersøkelsen. Studien utføres av Senter for samisk helseforskning ved Universitetet i Tromsø.

Det overordnede målet med SAMINOR 2 helseundersøkelsen er å få mer kunnskap om forekomst av både risikofaktorer og ulike sykdommer samt deres mulige årsaksforhold.

Hva innebærer studien?
I undersøkelsen vil du bli invitert til å svare på vedlagte spørreskjema og sende det tilbake til oss eller benytte vår nettbaserte spørreskjemaløsning. Dersom du velger nettbasert løsning framfor spørreskjemaet går du til http://saminor.uit.no og benytter følgende brukernavn og passord:

Hva skjer med den innsamlede informasjonen om deg?
Informasjonen som registreres om deg skal kun brukes slik som beskrevet i hensikten med studien. Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En kode knytter deg til dine opplysninger gjennom en navneliste. Det betyr at opplysningene er avidentifisert. Det er kun autorisert personell knyttet til prosjektet som har adgang til navnelisten og som kan finne tilbake til deg. Etter godkjenning fra Datatilsynet kan opplysningene dine settes sammen med opplysninger fra andre registre for forskningsformål. I alle disse tilfellene blir navnet og personnummeret fjernet. Dette kan være registre om trygd, sykdom, inntekt, utdanning, yrke og opplysninger fra tidligere SAMINOR- eller andre helseundersøkelser (både spørreskjema og blodprøver). Aktuelle registre er Kreftregisteret, Dødsårsaksregisteret, Reindriftsforvaltningens database, Folkeregisteret og folketellinger. Forsikringsselskaper eller andre kommersielle institusjoner vil ikke få tilgang til dataene. All videre behandling av helseopplysninger skjer etter godkjenning av Regional komité for medisinsk og helsefaglig forskningsetikk.

Det vil ikke være mulig å identifisere deg i resultatene av studien når disse publiseres. Du kan seinere bli kontaktet med forespørsel om du vil svare på tilleggspørreskjema eller vil delta i en klinisk helseundersøkelse. Prosjektslutt er satt til 31.12.2067. Etter dette vil dataene slettes eller anonymiseres.

Frivillig deltakelse
Det er frivillig å delta i studien. Ved å svare på skjemaet og returnere det per post eller svare på nettbasert skjema samtykker du i deltakelse i studien. Du kan når som helst og uten å oppgi noen grunn trekke ditt samtykke til å delta i studien. Du har rett til å få innsyn i hvilke opplysninger som er registrert om deg. Du har videre rett til å få korrigert eventuelle feil i de opplysningene vi har registrert. Dersom du trekker deg fra studien, kan du kreve å få slettet opplysninger, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner.

Dersom du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte **Anne Karen Hætta tlf. 404 90 467** eller **Ketil Lenert Hansen tlf. 907 91 116**, ved Senter for samisk helseforskning, Universitetet i Tromsø. Du kan bli kontaktet igjen per post med invitasjon om å delta i SAMINORs kliniske helseundersøkelse og nye spørreskjemaundersøkelser.

Økonomi
Studien er finansiert gjennom forskningsmidler fra de tre nordligste fylkeskommunene, Helse Nord, Samisk nasjonalt kompetansesenter, psykisk helsevern (SANKS), Sametinget, Universitetet i Tromsø og Helse og omsorgsdepartementet. Ingen av disse instansene har interessekonflikter i undersøkelsen.

Informasjon om utfallet av studien
Resultater av undersøkelsen vil publiseres i internasjonale og nasjonale vitenskapelige tidsskrifter i tillegg til ulike populærvitenskapelige kanaler og media.

Hilsen fra

Magritt Brustad
Professor Dr. Scient.

Ragnhild Vassvik Kalstad
Avdelingsleder

Appendix 3

Helse- og levekårs- undersøkelse

1. Jeg samtykker i å delta i undersøkelsen i henhold til informasjon gitt i informasjonsskrivet ☐ Ja

Egen helse

2. Hvordan er helsen din nå? (Sett bare ett kryss)

☐ Dårlig   ☐ Ikke helt god   ☐ God   ☐ Svært god

3. Har du, eller har du noen gang hatt?

	Ja	Nei	Alder ved start
Diabetes (sukkersyke)	☐	☐	
Høyt blodtrykk	☐	☐	
Angina pectoris (hjertekrampe)	☐	☐	
Hjerteinfarkt	☐	☐	
Psykiske plager som du har søkt hjelp for	☐	☐	
Kronisk bronkitt, emfysem, KOLS	☐	☐	
Astma	☐	☐	
Eksem	☐	☐	
Psoriasis	☐	☐	
Multippel sklerose (MS)	☐	☐	
Bechterews sykdom	☐	☐	

4. Har du i løpet av det siste året vært plaget med smerter og/eller stivhet i muskler og ledd som har vart i minst 3 måneder sammenhengende? ☐ Ja   ☐ Nei

Hvis ja, angi grad av plager fra de ulike deler av kroppen i tabellen nedenunder (ett kryss pr linje)

	Ikke plaget	En del plaget	Sterkt plaget
Nakke, skuldre	☐	☐	☐
Armer, hender	☐	☐	☐
Øvre del av ryggen	☐	☐	☐
Korsryggen	☐	☐	☐
Hofter, ben, føtter	☐	☐	☐
Hode	☐	☐	☐
Brystregionen	☐	☐	☐
Mageregionen	☐	☐	☐
Underliv	☐	☐	☐
Andre steder	☐	☐	☐

5. Hvor ofte har du i løpet av de siste 4 uker brukt følgende medisiner? (sett ett kryss pr linje)

	Ikke brukt siste 4 uker	Sjeldnere enn hver uke	Hver uke men ikke daglig	Daglig
Sovemedisin	☐	☐	☐	☐
Beroligende medisin	☐	☐	☐	☐
Medisin mot depresjon	☐	☐	☐	☐

6. Hvilke utsagn passer best på din helsetilstand i dag?

Gange

☐ Jeg har ingen problemer med å gå omkring
☐ Jeg har litt problemer med å gå omkring
☐ Jeg er sengeliggende

Personlig stell

☐ Jeg har ingen problemer med personlig stell
☐ Jeg har litt problemer med å vaske meg eller kle meg
☐ Jeg er ute av stand til å vaske meg

Vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- eller fritidsaktiviteter)

☐ Jeg har ingen problemer med å utføre mine vanlige gjøremål
☐ Jeg har litt problemer med å utføre mine vanlige gjøremål
☐ Jeg er ute av stand til å utføre mine vanlige gjøremål

Smerte og ubehag

☐ Jeg har verken smerte eller ubehag
☐ Jeg har moderat smerte eller ubehag
☐ Jeg har sterk smerte eller ubehag

Angst og depresjon

☐ Jeg er verken engstelig eller deprimert
☐ Jeg er noe engstelig eller deprimert
☐ Jeg er svært engstelig eller deprimert

7. Hvor mye veier du? (i hele kg)

8. Hvor høy er du? (i hele cm)

67

9. Vi ber deg angi din fysiske aktivitet etter en skala fra svært lite til svært mye. Skalaen nedenfor går fra 1–10. Med fysisk aktivitet mener vi både arbeid i hjemmet og i yrkeslivet, samt trening og annen fysisk aktivitet som turgåing o.l. Sett kryss i ruten som best angir ditt nivå av fysisk aktivitet.

	1	2	3	4	5	6	7	8	9	10	
Svært lite	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært mye

Familie og språkbakgrunn

I Nord-Norge bor det folk med ulik etnisk bakgrunn. Det vil si at de snakker ulike språk og har forskjellige kulturer. Eksempler på etnisk bakgrunn, eller etnisk gruppe er norsk, samisk og kvensk.

10. Hvilket hjemmespråk har/hadde du, dine foreldre og besteforeldre? (Sett ett eller flere kryss)

	Norsk	Samisk	Kvensk	Annet, beskriv:
Morfar	☐	☐	☐	☐ ....
Mormor	☐	☐	☐	☐ ....
Farfar	☐	☐	☐	☐ ....
Farmor	☐	☐	☐	☐ ....
Far	☐	☐	☐	☐ ....
Mor	☐	☐	☐	☐ ....
Jeg selv	☐	☐	☐	☐ ....

11. Hva er din, din fars og din mors etniske bakgrunn?
(Sett ett eller flere kryss)

	Norsk	Samisk	Kvensk	Annet, beskriv:
Min etniske bakgrunn er	☐	☐	☐	☐ ....
Min fars etniske bakgrunn er	☐	☐	☐	☐ ....
Min mors etniske bakgrunn er	☐	☐	☐	☐

12. Hva regner du deg selv som? (Sett ett eller flere kryss)

Norsk	Samisk	Kvensk	Annet, beskriv:
☐	☐	☐	☐

13. Hvordan vil du vurdere dine ferdigheter til å forstå, snakke, lese eller skrive samisk?

	Svært bra	Nokså bra	Med anstrengelse	Noen få ord	Ikke i det hele tatt
Forstå	☐	☐	☐	☐	☐
Snakke	☐	☐	☐	☐	☐
Lese	☐	☐	☐	☐	☐
Skrive	☐	☐	☐	☐	☐

Arbeid, trygd og økonomi

14. Hvor stor er familiens/husstandens bruttoinntekt per år?

- ☐ Under kr 150 000 kr.
- ☐ Kr 150 000–300 000
- ☐ Kr 301 000–450 000
- ☐ Kr 451 000–600 000
- ☐ Kr 601 000–750 000
- ☐ Kr 751 000–900 000
- ☐ Over 900 000

15. Hvor mange personer bor det i din husstand? Antall personer .... ☐|☐

16. Hvor mange års skolegang har du gjennomført?
(Ta med alle år du har gått på skole eller studert) .... ☐|☐

17. Bodde du på internat (statsinternat kommunalt eller privat) da du gikk på grunnskolen? .... ☐ Ja ☐ Nei

18. Hva har vært dine viktigste inntektskilder siste året?
(Sett ett eller flere kryss)

- ☐ Lønnsarbeid:
  - ☐ Heltid ☐ Deltid ☐ Sesong
- ☐ Selvstendig næring:
  - ☐ Heltid ☐ Deltid ☐ Sesong
- ☐ Alderspensjon/AFP
- ☐ Kontantstønad/overgangsstønad/foreldrepenger
- ☐ Dagpenger
- ☐ Sykepenger
- ☐ Arbeidsavklaringspenger
- ☐ Uførepensjon
- ☐ Stønad til livsopphold (sosial stønad)
- ☐ Støtte fra ektefelle/foreldre/søsken/barn
- ☐ Lån/studielån og stipend
- ☐ Annet (Oppsparte midler/arv/gevinst osv)

19. Mener du at du står i fare for å miste ditt nåværende arbeid eller inntekt de nærmeste 2 årene? .... ☐ Ja ☐ Nei

20. Kunne du tenke deg å flytte fra din nåværende bosteds-kommune dersom du fikk tilbud om arbeid et annet sted?

☐ Ja ☐ Kun deler av året ☐ Nei ☐ Vet ikke

21. Dersom du er i lønnet arbeid hvordan trives du i din nåværende jobb/næring?

☐ Svært godt ☐ Godt ☐ Dårlig ☐ Veldig dårlig

22. På bakgrunn av egen helse og erfaringene fra arbeidslivet, hvor sannsynlig tror du det er at du fortsetter i lønnet arbeid/næring fram til:

	Svært sannsynlig	Sannsynlig	Mindre sannsynlig	Svært lite sannsynlig
62 års alder	☐	☐	☐	☐
67 års alder	☐	☐	☐	☐
70 års alder	☐	☐	☐	☐
Eldre enn 70 år	☐	☐	☐	☐

23. Dersom du er selvstendig næringsdrivende, hvilke type næring jobber du i? (Sett ett eller flere kryss)

☐ Reindrift   ☐ Fiske

☐ Jordbruk   ☐ Skogbruk

☐ Forretningsdrift   ☐ Annet

Psykisk helse

24. Under finner du en liste over ulike problemer. Har du opplevd noe av dette de siste 4 ukene? (Sett ett kryss for hver plage)

	Ikke plaget	Litt plaget	Ganske mye	Veldig mye
Plutselig frykt uten grunn	☐	☐	☐	☐
Følt deg redd eller engstelig	☐	☐	☐	☐
Matthet eller svimmelhet	☐	☐	☐	☐
Følt deg anspent eller oppjaget	☐	☐	☐	☐
Lett for å klandre deg selv	☐	☐	☐	☐
Søvnproblemer	☐	☐	☐	☐
Nedtrykt, tungsindig	☐	☐	☐	☐
Følelse av å være unyttig, lite verd	☐	☐	☐	☐
Følelse av at alt er et slit	☐	☐	☐	☐
Følelse av håpløshet mht. framtida	☐	☐	☐	☐

25. Spørsmålene handler om hvordan du har følt deg og hvordan du har hatt det den siste uken. For hvert spørsmål, velg det svaralternativet som best beskriver hvordan du har hatt det. Hvor ofte i løpet av den siste uken har du: (Vennligst kryss av i boksen som er nærmest det utsagnet som best beskriver deg.)

	Hele tiden	Nesten hele tiden	Mye av tiden	En del av tiden	Litt av tiden	Ikke i det hele tatt
Følt meg glad og i godt humør	☐	☐	☐	☐	☐	☐
Følt meg rolig og avslappet	☐	☐	☐	☐	☐	☐
Følt meg aktiv og sterk	☐	☐	☐	☐	☐	☐
Følt meg opplagt og uthvilt	☐	☐	☐	☐	☐	☐
Følt at mitt daglige liv har vært fylt av ting som interesserer meg	☐	☐	☐	☐	☐	☐

26. Har du i løpet av de siste 12 månedene opplevd at ubehagelige minner har trengt seg på og forstyrret deg uten at du har kunnet gjøre noe med det?

☐ Nei   ☐ Ja, men sjelden   ☐ Av og til   ☐ Ofte

27. Har du i løpet av de siste 12 månedene bevisst unngått situasjoner for å slippe ubehagelige minner eller følelser, på en slik måte at det har hindret deg i å gjøre det du vil?

☐ Nei   ☐ Ja, men sjelden   ☐ Av og til   ☐ Ofte

28. Har du i løpet av de siste 12 måneder ikke vært i stand til å reagere følelsesmessig i situasjoner der de fleste andre reagerer?

☐ Nei   ☐ Ja, men sjelden   ☐ Av og til   ☐ Ofte

29. Angi hvor godt følgende påstander beskriver deg og familien din

	Stemmer dårlig				Stemmer helt
Jeg stoler fullt ut på mine vurderinger og avgjørelser	☐	☐	☐	☐	☐
Jeg trives best sammen med andre	☐	☐	☐	☐	☐
Jeg trives svært godt i familien min	☐	☐	☐	☐	☐
Troen på meg selv får meg gjennom vanskelige perioder	☐	☐	☐	☐	☐
Jeg knytter lett nye vennskap	☐	☐	☐	☐	☐
Det er godt samhold i familien min	☐	☐	☐	☐	☐
I motgang klarer jeg å finne noe bra å vokse på	☐	☐	☐	☐	☐
Jeg er flink til å få kontakt med nye folk	☐	☐	☐	☐	☐
Familien min ser positivt på fremtiden selv i vanskelige perioder	☐	☐	☐	☐	☐
Jeg klarer å akseptere hendelser i livet som er umulig å forandre	☐	☐	☐	☐	☐
Jeg synes det er enkelt å finne på noe bra å snakke om	☐	☐	☐	☐	☐
I familien vår er vi lojal mot hverandre	☐	☐	☐	☐	☐

Tobakk og rusmidler

30. Røyker du, eller har du tidligere røykt?

☐ Ja, daglig   ☐ Ja, tidligere   ☐ Ja, av og til   ☐ Nei, aldri

Hvor mange sigaretter røyker du vanligvis daglig? ☐☐

Alder i år
Hvor gammel var du da du begynte å røyke daglig? ☐☐

31. Bruker du, eller har du tidligere brukt snus?

☐ Ja, daglig   ☐ Ja, tidligere   ☐ Ja, av og til   ☐ Nei, aldri

Til deg som snuser daglig: Hvor mange porsjoner bruker du hver dag? ☐☐

Til deg som snuser av og til: Hvor mange porsjoner bruker du vanligvis pr uke? ☐☐

Alder i år
Hvis ja, hvor gammel var du da du begynte å snuse daglig? ☐☐

32. Omtrent hvor ofte har du i løpet av det <u>siste året</u> drukket alkohol? (Lettøl og alkoholfritt øl regnes ikke med)

☐ Aldri drukket alkohol
☐ Har ikke drukket alkohol siste året
☐ Noen få ganger siste året
☐ Omtrent en gang i måneden
☐ 2–3 ganger pr måned
☐ Ca. 1 gang i uka
☐ 2–3 ganger i uka
☐ 4–7 ganger i uka

33. Har du drukket alkohol i løpet av de <u>siste 4 uker?</u> ☐ Ja   ☐ Nei

Hvis ja, har du drukket så mye at du har kjent deg <u>sterkt beruset (full)</u>?

☐ Nei   ☐ Ja, 1–2 ganger   ☐ Ja, 3 ganger eller mer

34. Vil du karakterisere ditt alkoholbruk eller drikkemønster som periodisk (drikker <u>ofte</u> og <u>mye</u> i perioder, for så å ha <u>lengre perioder</u> uten alkoholinntak)?
(sett ett eller flere kryss)

☐ Ja, siste 12 måneder   ☐ Ja, tidligere   ☐ Nei

35. Har du noen gang brukt narkotika?
(sett ett eller flere kryss)

	Ja, siste året	Ja, tidligere	Nei
Hasj/marihuana (cannabis)	☐	☐	☐
Andre narkotiske stoffer for eksempel LSD, amfetamin, ecstasy, kokain, heroin, GHB, o.l.	☐	☐	☐

Religion og livssyn

36. Er du, dine foreldre eller dine besteforeldre knyttet til noen av de følgende livssynssamfunn: (sett ett eller flere kryss)

	Meg selv	Mor	Far	Beste-foreldre
Statskirka	☐	☐	☐	☐
Læstadiansk forsamling	☐	☐	☐	☐
Annen religiøs forsamling/fellesskap	☐	☐	☐	☐
hvilket:				
Ikke-religiøst livssynssamfunn	☐	☐	☐	☐
hvilket:				
Ikke medlem av noe livssynssamfunn	☐	☐	☐	☐

37. Hvordan stiller du deg til religion?

☐ Jeg er troende/bekjennende kristen (personlig kristen)
☐ Jeg tror det finnes en Gud, men religion betyr ikke så mye for meg i det daglige
☐ Usikker
☐ Jeg tror ikke det finnes noen Gud

38. Hvor ofte har du i løpet av de siste 6 måneder vært på/i:
(Sett ett kryss pr linje)

	Mer enn 3g/mnd	1–3 g/mnd	1–6 g/siste 6 mnd	Aldri
Kirke	☐	☐	☐	☐
Forsamlings-/menighetshus	☐	☐	☐	☐
Humanetisk tilstelning	☐	☐	☐	☐
Annen religiøs bygning	☐	☐	☐	☐

Selvopplevd diskriminering

Diskriminering forekommer når en person eller gruppe av mennesker blir behandlet mindre fordelaktig enn andre på bakgrunn av f.eks. etnisk opprinnelse, religion, tro, funksjonshemning, alder eller seksuell legning.

39. Har du opplevd å bli diskriminert?

☐ Ja, de to siste årene   ☐ Ja, før   ☐ Nei   ☐ Vet ikke

Dersom du svarte ja, på forrige spørsmål, besvar spørsmål 40–47. Hvis du har svart nei, går du videre til spørsmål 48.

40. Dersom du har vært utsatt for diskriminering, hvor ofte skjedde det?

☐ Svært ofte   ☐ Noen ganger   ☐ En sjelden gang

41. Hvorfor tror du at du ble diskriminert? Skyldes diskrimineringen: (Sett ett eller flere kryss)

☐ Funksjonshemning   ☐ Seksuell legning
☐ Lærevansker   ☐ Kjønn
☐ Religion eller tro   ☐ Nasjonalitet
☐ Etnisk bakgrunn   ☐ Geografisk tilhørighet
☐ Alder   ☐ Sykdom
☐ Andre årsaker, spesifiser: ☐ Vet ikke

42. Kan du angi hvor diskrimineringen foregikk? (Sett ett eller flere kryss)

☐ På Internett
☐ I skolen/utdanning
☐ I arbeidslivet
☐ I forbindelse med jobbsøkning
☐ I frivillig arbeid/organisasjoner
☐ I møtet med det offentlige
☐ I familie/slekt
☐ Da du skulle leie/kjøpe bolig
☐ Da du skulle skaffe banklån
☐ I forbindelse med å få medisinsk behandling
☐ På butikken eller ved restaurantbesøk
☐ I lokalsamfunnet
☐ Annet sted, spesifiser:

43. Kan du angi hvem som diskriminerte deg?
(Sett ett eller flere kryss)

☐ Offentlig ansatt

☐ Ukjente

☐ Arbeidskollegaer

☐ En eller flere fra samme etniske gruppe som deg selv.

☐ En eller flere fra annen etnisk gruppe enn deg selv.

☐ Medelever/studenter

☐ Lærere/ansatte

☐ Andre

44. Gjorde du noe aktivt for å få slutt på diskrimineringen? .... ☐ Ja ☐ Nei

45. Har du noen gang tatt kontakt med Likestillings- og diskrimineringsombudet for råd eller hjelp angående diskriminering?

☐ Ja ☐ Nei ☐ Husker ikke

46. Hvor mye berørte diskrimineringen deg?

☐ Ikke i det hele tatt ☐ Litt ☐ Noe ☐ Mye

47. Har du opplevd at du har blitt diskriminert fordi du er same?

☐ Ja ☐ Nei ☐ Vet ikke ☐ Er ikke same

Vold og overgrep

48. Har du opplevd at noen systematisk og over lengre tid har forsøkt å kue, fornedre eller ydmyke deg? (Sett ett eller flere kryss)

☐ Nei, aldri ☐ Ja, som barn (under 18 år)

☐ Ja, som voksen (18 år eller over) ☐ Ja, de siste 12 mnd

Hvis ja, av hvem?

☐ Fremmed person ☐ Samlivspartner

☐ Familie, slektning ☐ Andre kjente

49. Er du blitt utsatt for fysiske overgrep/mishandling? (Sett ett eller flere kryss)

☐ Nei, aldri ☐ Ja, som barn (under 18 år)

☐ Ja, som voksen (18 år eller over) ☐ Ja, de siste 12 mnd

Hvis ja, av hvem?

☐ Fremmed person ☐ Samlivspartner

☐ Familie, slektning ☐ Andre kjente

50. Er du blitt utsatt for seksuelle overgrep? (Sett ett eller flere kryss)

☐ Nei, aldri ☐ Ja, som barn (under 18 år)

☐ Ja, som voksen (18 år eller over) ☐ Ja, de siste 12 mnd

Hvis ja, av hvem?

☐ Fremmed person ☐ Samlivspartner

☐ Familie, slektning ☐ Andre kjente

51. Hvis du har vært utsatt for noen form for overgrep, har du betrodd deg til noen? (Sett ett eller flere kryss)

☐ Nei ☐ Noen i familien ☐ Venner ☐ Fagfolk

Tannhelse

52. Hvordan vurderer du tannhelsen din

☐ Dårlig ☐ Ikke helt god ☐ God ☐ Svært god

53. Har du tannprotese/gebiss? .... ☐ Ja ☐ Nei

54. Bruker du selv noen av følgende hjelpemidler – og i tilfelle hvor ofte?

	Regelmessig/ daglig	Uregelmessig/ noen ganger i uka	Uregelmessig/ noen ganger i mnd.	Sjeldnere/ aldri
Tannbørste	☐	☐	☐	☐
Fluortannkrem	☐	☐	☐	☐
Tanntråd	☐	☐	☐	☐
Tannstikkere	☐	☐	☐	☐
Fluortabletter	☐	☐	☐	☐
Skyllevæske	☐	☐	☐	☐
Protesebørste	☐	☐	☐	☐

55. Når var du sist hos tannlege eller tannpleier?

☐ Mindre enn ett år siden ☐ 1–2 år siden

☐ 3–5 år siden ☐ Mer enn 5 år siden

56. Hvis det er mer enn 2 år siden, hva er da grunnen ?
(Sett ett eller flere kryss)

☐ Jeg har ikke blitt innkalt

☐ Det er lang ventetid hos tannlegen

☐ Jeg har ikke hatt tid

☐ Økonomiske årsaker

☐ Jeg har ikke hatt behov for tannbehandling

☐ Jeg er redd eller engstelig for å gå til tannlege

☐ Andre årsaker:

....

57. Hvordan bruker du tannhelsetjenesten? (Sett ett eller flere kryss)

☐ Blir regelmessig innkalt av tannlege eller tannpleier

☐ Melder meg regelmessig for undersøkelse

☐ Melder meg når jeg har vondt eller har mistet en fylling

☐ Bruker ikke å gå til tannlege så ofte

58. Har du i løpet av de to siste årene fått en eller flere av disse diagnosene hos tannlege ?

	Ja	Nei	Vet ikke
Alvorlig tannkjøttsbetennelse	☐	☐	☐
Mild tannkjøttsbetennelse	☐	☐	☐
Munntørrhet	☐	☐	☐
Hull (karies) i en eller flere tenner	☐	☐	☐
Andre diagnoser	☐	☐	☐

59. Er du fornøyd med tennene dine eller protesene? Angi svaret på en skala der 1 er svært misfornøyd og 5 er svært fornøyd

	1	2	3	4	5	
Svært misfornøyd	☐	☐	☐	☐	☐	Svært fornøyd

60. Hvor ofte pusset du tennene dine som 10-åring?

☐ En gang om dagen eller mer

☐ Av og til

☐ Sjelden eller aldri

61. Hvor ofte kontrollerte foreldrene eller dine foresatte at du hadde pusset tennene dine, da du var i 10-årsalderen?

☐ Ofte (omtrent daglig)   ☐ Av og til   ☐ Aldri

62. Om du har barn under 6 år boende hos deg, hvor ofte hjelper du til med tannpuss eller kontrollerer at barna har pusset tennene sine?

☐ Ofte (omtrent daglig)   ☐ Av og til   ☐ Aldri

63. Om du har barn som er mellom 6–12 år boende hos deg; hvor ofte hjelper du til med tannpuss eller kontrollerer at barna har pusset tennene sine?

☐ Ofte (omtrent daglig)   ☐ Av og til   ☐ Aldri

64. Dersom du har barn i aldergruppen 0–12 år boende hjemme hos deg, har dere da praktisert faste regler for spising av sjokolade og andre søtsaker for barna?

☐ Ja   ☐ Nei

65. Hvor fornøyd er du med tannhelsetjenesten i din kommune?

svært misfornøyd ☐ ☐ ☐ ☐ ☐ svært fornøyd   ☐ Vet ikke

Selvmord og selvmordsatferd

66. Har du mistet noen som har stått deg nær i selvmord? ☐ Ja   ☐ Nei

67. Har du tenkt på å ta livet ditt?

☐ Ja, det siste året   ☐ Ja, tidligere   ☐ Nei, aldri

68. Har du forsøkt å ta ditt eget liv?

☐ Ja, det siste året   ☐ Ja, tidligere   ☐ Nei, aldri

69. Har du skadet deg selv med vilje?

☐ Ja, det siste året   ☐ Ja, tidligere   ☐ Nei, aldri

Dersom du har forsøkt å ta livet ditt, kan du svare på spørsmålene som følger. Hvis du har svart nei på dette spørsmålet, kan du gå videre til spørsmål nr 76.

70. På hvilken måte forsøkte du å ta ditt eget liv? (Sett ett eller flere kryss)

☐ Henging   ☐ Skytevåpen

☐ Skarp gjenstand   ☐ Overdose piller/medikamenter

☐ Annen måte

71. Hva var motivet for å forsøke å ta ditt eget liv?

Et klart ønske om å dø ☐ Ja   ☐ Nei

Situasjonen føltes uutholdelig ☐ Ja   ☐ Nei

Jeg ønsket hjelp fra noen ☐ Ja   ☐ Nei

72. Var du beruset/rusa da du forsøkte å ta ditt eget liv? ☐ Ja   ☐ Nei

73. Hvor gammel var du første gang du forsøkte å ta ditt eget liv? ☐

74. Hvor mange ganger har du forsøkt å ta ditt eget liv? ☐

75. Fortalte du til andre om selvmordsforsøket/ene? (Sett ett eller flere kryss)

☐ Nei   ☐ Noen i familien   ☐ Venner   ☐ Fagfolk

Spilleatferd

76. Har du noen gang følt behov for å spille for mer og mer penger? (Sett ett eller flere kryss)

☐ Ja, siste året   ☐ Ja, tidligere   ☐ Nei

77. Har du noen gang løyet for mennesker som er viktige for deg, om hvor mye du spiller? (Sett ett eller flere kryss)

☐ Ja, siste året ☐ Ja, tidligere ☐ Nei

78. Har du noen gang hatt perioder da du, etter å ha tapt penger på spill en dag, har vendt tilbake en annen dag for å vinne de tilbake? (Sett ett eller flere kryss)

☐ Ja, siste året ☐ Ja, tidligere

☐ Nei ☐ Vet ikke/husker ikke

79. Har du i løpet av siste året spilt online rollespill?

☐ Ja, daglig ☐ Ja, ukentlig

☐ Ja, månedlig eller sjeldnere ☐ Nei

Erfaringer og bruk av helsetjenester

80. Den legen du vanligvis bruker er det

☐ Din fastlege ☐ Annen lege

81. Hvor lenge har du hatt din nåværende fastlege?

☐ Mindre enn 6 mnd ☐ 6 til 11 måneder

☐ 12 til 24 mnd ☐ Mer enn 2 år

82. Har du i løpet av de siste 12 mnd kontaktet fastlegen din for hjelp eller råd til deg selv? ☐ Ja ☐ Nei

Hvis ja, opplevde du at du fikk den hjelpa du ba om?

☐ Aldri ☐ Av og til ☐ Vanligvis ☐ Alltid

83. Hvor fornøyd eller misfornøyd er du med følgende sider ved fastlegetjenesten?

	Meget fornøyd	Fornøyd	Misfornøyd	Meget misfornøyd	Vet ikke
Fastlegens tilgjengelighet på telefon	☐	☐	☐	☐	☐
Ventetid for å få time hos fastlege	☐	☐	☐	☐	☐
Tid hos fastlegen	☐	☐	☐	☐	☐
Fastlegens forståelse for dine problem	☐	☐	☐	☐	☐
Fastlegens informasjon om dine helseplager, undersøkelse og behandlingsopplegg	☐	☐	☐	☐	☐
Totalt sett, hvor fornøyd eller misfornøyd er du med den kommunale helsetjenesten?	☐	☐	☐	☐	☐

Med spesialisthelsetjenesten menes det sykehus, distriktspsykiatrisk senter (DPS), spesialistlegesenter eller enkeltspesialist

84. Har du i løpet av de siste 12 måneder vært til undersøkelse eller behandling for *fysiske plager* hos

☐ Sykehus ☐ Spesialistlegesenter

☐ Privatpraktiserende spesialist ☐ Ingen av delene

85. Har du i løpet av de siste 12 måneder vært til undersøkelse eller behandling for *psykiske plager* hos

☐ Psykiatrisk sykehus ☐ Distriktspsykiatrisk senter

☐ Privatpraktiserende spesialist ☐ Ingen av delene

86. Dersom du har vært til behandling hos spesialist for fysiske eller psykiske plager, svar på følgende spørsmål Svar på en skala fra 0 til 10 (0 = i liten grad 10 = i stor grad)

Fikk du anledning til å fortelle det du følte var viktig om din tilstand?

	0	1	2	3	4	5	6	7	8	9	10	Ikke aktuelt
For fysiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
For psykiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Snakket legene/behandlerne til deg slik at du forstod dem?

	0	1	2	3	4	5	6	7	8	9	10	Ikke aktuelt
For fysiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
For psykiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Føler du at du fikk være med å bestemme over din behandling?

	0	1	2	3	4	5	6	7	8	9	10	Ikke aktuelt
For fysiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
For psykiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Er du blitt bedre av behandlingen?

	0	1	2	3	4	5	6	7	8	9	10	Ikke aktuelt
For fysiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
For psykiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Alt i alt, har du tillit til sykehuset eller spesialisten du var hos?

	0	1	2	3	4	5	6	7	8	9	10	Ikke aktuelt
For fysiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
For psykiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Alt i alt, hvor tilfreds er du med pleien og behandlingen du eventuelt fikk?

	0	1	2	3	4	5	6	7	8	9	10	Ikke aktuelt
For fysiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
For psykiske plager	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Erfaringer med henvisning

87. Har du i løpet av de siste 12 måneder ønsket å bli henvist til spesialist, men ikke blitt det?

For fysiske plager

☐ Nei, aldri ☐ Ja, en gang

☐ Ja, flere ganger ☐ Ikke aktuelt

For psykiske plager

☐ Nei, aldri ☐ Ja, en gang

☐ Ja, flere ganger ☐ Ikke aktuelt

88. Har du i løpet av de siste 12 måneder ønsket å bli henvist til fysioterapeut, kiropraktor eller liknende, men ikke blitt det?

☐ Nei, aldri ☐ Ja, en gang

☐ Ja, flere ganger ☐ Ikke aktuelt

89. Dersom du ble henvist, hvor lenge ventet du på time?

Antall uker ☐

90. Har du bedt om fritt sykehusvalg ved henvisning til spesialistbehandling?

☐ Ja ☐ Nei ☐ Ikke aktuelt

Språk ved legebesøk

91. Sist du var hos fastlegen, hvilket språk snakket du og legen sammen på?

	Norsk	Samisk	Annet, beskriv:
Jeg snakket	☐	☐	☐ ....
Legen snakket	☐	☐	☐ ....

92. Sist du var på sykehus/hos spesialist, hvilket språk snakket du og legen sammen på?

	Norsk	Samisk	Annet, beskriv:
Jeg snakket	☐	☐	☐ ....
Legen snakket	☐	☐	☐ ....

93. Hvilket språk ønsker du først og fremst å snakke med helsepersonell på? (sett ett eller flere kryss)

Norsk Samisk Annet, beskriv:

☐ ☐ ☐ ....

Bruk av tolk

94. Hvis du har svart «samisk», men ikke fikk tilbud om samisk-talende lege ved siste legebesøk, ble det da tilbudt tolk?

Hos fastlegen:

☐ Ja ☐ Nei

☐ Ønsker ikke å bruke tolk ☐ Ikke aktuelt

På sykehus/hos spesialist:

☐ Ja ☐ Nei

☐ Ønsker ikke å bruke tolk ☐ Ikke aktuelt

95. Dersom samisktalende tolk ble brukt ved siste legebesøk, hvem fungerte da som tolk?

Hos fastlegen:

☐ Offentlig ansatt tolk ☐ Familie

☐ En ansatt på legekontoret ☐ Annet

På sykehus/hos spesialist:

☐ Offentlig ansatt tolk ☐ Familie

☐ Annen sykehusansatt ☐ Annet

96. Hvis du noen gang har vært til legeundersøkelse/ behandling der det ble brukt samisktalende tolk, hvor fornøyd er du med kommunikasjonen/samtalen mellom deg og legen/ behandleren?

Hos fastlegen:

☐ Meget fornøyd ☐ Fornøyd

☐ Misfornøyd ☐ Meget misfornøyd

☐ Vet ikke

På sykehus/hos spesialist:

☐ Meget fornøyd ☐ Fornøyd

☐ Misfornøyd ☐ Meget misfornøyd

☐ Vet ikke

97. Har du noen gang opplevd at du ikke har fått norsk/samisk tolkehjelp selv om du ba om det?

☐ Ja, det har hendt at jeg har bedt om tolk, men ikke fått det.

☐ Nei, jeg har alltid fått tolk hvis jeg har bedt om det

☐ Har aldri spurt om tolk

Takk for at du deltok i undersøkelsen!