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Snus intervention among dental personnel in Norway

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Abstract

Objectives: The aim of our study was to investigate dentists' and dental hygienists' practices concerning snus cessation in the dental clinics, and to map if they have enough knowledge about snus. We also wanted to see if there are differences between dentists and dental hygienists in cessation activity and successfulness, and what methods are used for intervention.

Methods: A questionnaire was published on two different private groups on Facebook; "Oss tannleger i mellom" and "Oss tannpleiere i mellom". Altogether 354 dental professionals replied (244 dentists and 110 dental hygienists).

Results: Majority of both professions agreed that it is the responsibility of the dental personnel to give information and to practice snus intervention. The hygienists reported to practice snus cessation more frequently than the dentists. Cessation was practiced more often in the public sector than in the private sector. More hygienists than dentists reported to have high knowledge concerning snus, and those who considered their knowledge to be high were also the ones who practiced snus cessation most often. Snus intervention success seemed to correspond with knowledge level and how often snus intervention was performed. About two third of the dentists and half of the hygienists thought that there was not enough information available about snus.

Conclusions: The results from our study showed that there was a great variety in knowledge level and intervention activity among dental personnel. There is room for improvement, and clearer guidelines are needed. We should take more advantage of the unique arena of the dental clinics for practicing snus cessation.

Keywords:

Snus, cessation, dentist, dental hygienist, Norway

Preface and acknowledgements

The idea behind this study was based on our subjective experiences from different dental clinics in Northern Norway during our external practice. We met a great diversity of opinions regarding snus cessation and the information given to the patients by the dental personnel. In Norway, we have well developed guidelines for smoking cessation, which are also incorporated in daily practice of the dental personnel. However, the guidelines for snus cessation are not as well-known and we expected that there may be a bigger gap in the information given to snus using patients than to the patients who smoke. Hence, we wanted to study whether there are differences between dental personnel when concerning snus intervention and how they advise their patients to stop using snus.

We have had a good amount of help and guidance in designing this thesis from the beginning to the end. We would like to thank the people who have guided us in the right direction and made the completion of the dissertation possible. Thank you, Maja-Lisa Løchen (professor at UiT The Arctic University of Norway), Helle Nyhuus (dentist and administrator of the Facebook group “Oss tannleger i mellom”), Heidi Øvstrud Strøm (dental hygienist and administrator of the Facebook group “Oss tannpleiere i mellom”) and to the respondents of our questionnaire. Also, a big thank goes to our supervisor, Sisko Honkala (professor at the Department of Clinical Dentistry, UiT The Arctic University of Norway) for her advice and support throughout this thesis.

Introduction

Snus is a smokeless tobacco product used orally between gingiva and lip. Snus contains, in varying degree, the addictive substance nicotine (1). Also, several carcinogenic tobacco-specific nitrosamines (TSNA) have been identified in snus. Both nicotine and TSNA are known to have negative health effects (1, 2). The moist snuff used in both Norway, Sweden and Finland is almost entirely the Swedish snus type (1). Except for Sweden and Norway (and partially Denmark), the sale of snus is prohibited in Europe (3).

Epidemiology

During the last decades in Norway, there has been a decrease in the number of daily and occasionally smokers in both genders (4). However, daily and occasionally snus users have simultaneously increased, especially among the adolescents, young adults and women (5). Among adolescents (16-17-year-olds), the prevalence of daily snus use increased from 4,3% in 2002 to 11,9% in 2010 (6). Between 1985 and 2013, the use of snus (daily or occasionally) increased from almost non-existent to 18% among 16-30-year-old women, and from 9% to 33% among men in the same age group (7). In Sweden, the development in the consumption of tobacco products has been quite similar as in Norway. However, snus use in Sweden is higher. The daily use of snus increased from 16,8% in 2008-2009 to 29,6% in 2016 among 16-24-year-old males and from 15,4% to 31,8 % among 25-34-year-old males (8). The respective proportions for the 25-34-year-old females were 3,9% and 6,9%. Among younger females, the use of snus decreased from 4,0% to 2,0% (8).

According to a study among young (16-20-year-old) Norwegians in 2009, use of snus was considered trendier than smoking (9). Males more often than females gave this as a reason for the snus use. Many of the young snus users exhibit the same social characteristics as smokers, such as lower education and lower socioeconomic status than non-tobacco users (6).

However, in the same study, snus users reported also to have a higher level of self-perceived social acceptance. A research from 2014 about availability of snus and cigarette smoking relieved that the most used product for smoking cessation was snus (7). It has also been suggested that an increased number of snus users might be a consequence of smoking restrictions in public places (10). In Sweden, former smokers have been shown more likely to be current snus users than those who have never smoked (11).

Negative health effects caused by snus use

In 2013, the Norwegian Institute of Public Health was commissioned by the Ministry of Health and Care to evaluate the health risks caused by snus use in Norway (12). Based on earlier scientific studies and research papers, they compiled a report titled “Health risks of Scandinavian snus consumption”. The report concludes that the use of snus increases the risk for cancer in pancreas, esophagus, oral cavity, lungs, gastric, colon and rectum. Use of snus also increases the risk of harmful pregnancy outcomes like decreased birth weight, premature birth and stillbirth. In addition, increased risk of diabetes mellitus type II, mucosal changes in oral cavity and local gingival recession are reported to be associated with the use of snus (12).

Convincing evidence exists for the association between the use of smokeless tobacco and increased risk for cancer in the oral cavity, pancreas and esophagus (13). Snus use has also been shown to affect insulin secretion negatively and thus, snus users have an increased risk for diabetes mellitus type II compared to non-snus users (14). In addition, it has been shown that there is an increased risk for stillbirth if pregnant women use snus during pregnancy (15). However, there is no evidence that the use of snus during pregnancy increases the neonatal mortality. In a study where the test subjects (male) were given nicotine, nicotine significantly impaired erectile function (16). A recently published article reported an association between snus use and asthma, all asthmatic symptoms, chronic bronchitis and chronic rhinosinusitis as well as an increased risk for the sleeping problems like snoring and difficulty inducing sleeping (17). An epidemiological study has shown an increased risk of heart failure and increased fatality from acute myocardial infarction among snus users compared to the non-snus users (18).

Use of snus can almost invariably cause mucosal change in the area where the snus (“tea-bag”-like) sachets are kept. These changes can be white and/or red mucosal damage and the degree of lesion (thickening, color, wrinkling etc.) is associated with the increasing daily intake and the number of years with the habit (19). Additionally, there is a greater risk of gingival recession in sites where the snus is kept (19). Although smoking tobacco is a strong risk factor for periodontal disease, there is not enough evidence for confirming the relationship between snus use and periodontitis (20, 21).

General practitioners, dentists and other health personnel have an important role to provide information to patients about health and health risks, and advice from these professions is usually taken seriously (22). Regarding snus use, there is varying perceptions of the relative harmfulness of snus. A study among general practitioners in Norway found out that the majority (81%) of general practitioners believed that snus was less harmful than cigarettes, 13,9% considered smoking and snus use equally damaging, and 1,4% considered snus more damaging than smoking (22). This report also concluded that those who ranged snus as less damaging, more often recommended snus as a substitute for smoking cessation.

Snus intervention

A tobacco intervention study in 2002 demonstrated that the dental personnel in Norway had a lack of knowledge considering snus and tobacco use (10). Altogether, 982 dentists and 319 dental hygienists participated in this study. About every third (30%) of the dentists who responded said it was not a part of their duty to perform snus cessation with their patients and every fifth (22%) of the dental hygienists reported the same. Both dentists and dental hygienists reported to use more time per week on smoking cessation than on snus cessation. Due to the reduction in the number of smokers, and to the expected increase of snus users in Norway, there would be a great need for encouraging dental personnel to speak more about snus use and intervention to their patients (10).

Guidelines

The Norwegian Directorate of Health (NDH) has national professional guidelines for smoking cessation (23). The website of the NDH contains information about different tobacco products for health personnel and other professionals (24). They propose methods and tools for guiding patients to tobacco cessation (25), including an introduction to a conversation method called motivational interview and a presentation of different pharmaceuticals and nicotine substitutes that can be used in tobacco cessation. The website of the NHD includes also a conversational guide “Snakk om snus- og røykeslutt”, which is a suggestion to the practitioners on how to talk about tobacco to their patients (26). Other utilities on the NDH’s website are brochures, posters and other information material for patients and public. The NDH also encourage to show the patients tips and advice about snus- and smoking cessation on slutta.no (27), the Facebook page “Slutta – din røykeslutt” (28), and their app “Slutta”.

The dental clinic – a unique arena

Dentists and dental hygienists form an excellent resource and have a big opportunity and responsibility to influence patients' oral health habits. Holst et al. (29) reported in 2005, that 87% of the adult population had visited a dentist during the last two years. All children and adolescents between 0-18 years in Norway receive free dental treatment and regular re-calls to see their dentist or dental hygienist (30). Therefore, these age groups are well taken care of by dental personnel. The highest increase in snus consumption is seen among the younger population, and this group the dental personnel in public sector can interfere the most.

But do we take advantage of our unique position to practice snus cessation, and if we do, do we succeed? Do we have enough knowledge about snus to feel comfortable in practicing snus cessation, or do we need more knowledge? Are there differences in the ways we practice? Are dental hygienists better to practice snus cessation than dentists?

Thus, the main objective of this study was to map dental personnel's knowledge about snus and practices concerning snus intervention. We also aimed to detect which factors predict the variation in their intervention activity and success as well as what methods are used in intervention.

Hypothesis

Our hypothesis was that dentists and dental hygienists do not feel that they have enough knowledge concerning snus and therefore do not practice cessation as much as they should. We also expected the dental hygienists to be more active and successful at snus cessation than the dentists, and that time limitation will determine how often they practice cessation.

Material and methods

We prepared a questionnaire through "Questback" (31) and published it on two different private groups on Facebook (32). These groups are exclusive for only dentists and respectively dental hygienists in Norway and are named "Oss tannleger i mellom" and "Oss tannpleiere i mellom". We cooperated with the administrators of these Facebook groups who posted the survey on behalf of us. Due to the restricted group policy, students cannot be members. Before publishing the questionnaire, we asked three dentists and two colleagues to fill in and comment the survey. Based on this pilot, one question was deleted before

publishing, because it was unclear for the readers. The questionnaire was published in the Facebook (FB) groups at the first time on the 12th of February 2017, and after that, it was republished two times in both groups. The questionnaire was available for approximately two months, and the administrators of the groups sent reminders several times. The survey was anonymous and it was voluntary to participate in.

The dentists' FB group had 3 045 members at the time when the questionnaire was finished. For the dental hygienists' FB group the respective number of members was 686. In total, 354 of 3 721 dental professionals replied to the questionnaire: 244 dentists (7,9% from dentists' FB group) and 110 dental hygienists (16,3% from hygienists' FB group).

The survey was published in Norwegian. It consisted of 22 structured questions, including background information about the respondents (i.e. gender, age, profession, which county and which sector they practice in, and how long they have practiced their profession). It also included personal tobacco habits, self-estimated knowledge about negative health effects of snus use, and information about how many patients the respondents have guided/informed about snus during the last year.

Furthermore, the respondents were asked:

- How often they ask their patients about snus use
- How often they record their patients' snus use
- How often they give information about negative health effects of snus use
- If they think there is enough information available about snus for dental personnel
- Which methods/aids they recommend for snus cessation
- What are the barriers in cases where they do not give information
- To what extent they think they have succeeded in snus cessation among their patients
- If they think it is within their field of expertise to give information/to perform intervention among patients who use snus

In the questionnaire, an open question was also included where the respondents could add comments. The full questionnaire is attached in Norwegian and English languages (Appendix 1 and 2).

Statistical analyses

IBM SPSS Statistics for Windows and Macintosh, Version 24,0 (Armonk, NY: IBM Corp.) were used for analyzing the data. Analyses started by producing frequency distributions (%) for all variables. All the variables were categorized and thus, cross-tabulations and a Chi-square test was used for measuring possible differences between the different independent variables. A statistically significant difference was set at a p-value < 0,05.

Only 8 specialists responded to the questionnaire. Therefore, dentists and specialists were combined in the analysis. There were only one male dental hygienist and thus the gender was not used as a background variable for the hygienists.

Chi-square test

A. Sample description

Possible differences between the dentists and the dental hygienists and within the professions were studied according to the different background factors; gender, age, area where practicing, how long they have been practicing, in which sector they work in, and personal snus use and smoking habits.

B. Snus knowledge and intervention between the professions

Possible differences between the dentists and the dental hygienists were studied according to:

- 1) Level of knowledge concerning the negative health effects of snus use
- 2) Number of patients they have informed about snus in the past year
- 3) Self-evaluated success in snus intervention
- 4) Asking about snus use if there are no clinical signs
- 5) Asking about snus use if there are clinical signs
- 6) Documenting patients' snus use
- 7) Informing snus-using patients about the negative health effects of snus
- 8) Frequency of how often they inform patients about negative health effects of snus
- 9) Snus intervention methods used
- 10) Recommending snus use as a smoking cessation aid
- 11) Reasons for not giving information about snus use
- 12) Opinions about the responsibility to give information/help patients to quit using snus
- 13) Opinions about available information (for professionals) about snus use

C. Snus knowledge and intervention within the professions

It was studied if there was an association between different background factors and

- knowledge level about snus,
- tendency to recommend snus as a substitute for smoking,
- snus intervention success, and
- methods used for snus intervention.

ANOVA

The one-way analysis of variance (ANOVA) was used to determine whether there would be a statistically significant difference between the mean number of topics covered always/often in snus intervention among the dentists and the dental hygienists. In the question concerning negative effects of snus use (i.e. gingival recession, periodontitis, tooth discoloration, cancer, and adverse pregnant outcomes), the respondents could select several options. This summary variable could therefore be considered as a continuous variable. In addition to the mean and the significance of the difference, the ANOVA-test also produces a standard deviation (SD), a standard error (SE), and the 95% confidence interval (95% CI) for the mean.

Results

Background

The response rate of the dentists and specialists in the Facebook group “Oss tannleger i mellom” was 7,9% (n=244/3 045) and of the dental hygienists at “Oss tannpleiere i mellom” 16,3% (n = 110/676). Altogether 9,5% replied (354/3 721). Significantly more female than male dentists replied to the questionnaire (n=170 vs. 74; p<0,001). More hygienists than dentists were in the age group of 30 years or younger (40,9% vs. 26,6%) and more dentists than hygienists were between 31-40 years (43,9% vs. 22,7%) (p=0,002). Age distribution is illustrated in Figure 1.

There was a significant difference (p<0,001) between age and what sector the respondents were currently working in. In the private sector, 62,9% were in the age group of 41-50 years. The respective figure in the public sector was 17,1%. About half of all the respondents reported to be currently working in the county of Eastern Norway (Fig. 2).

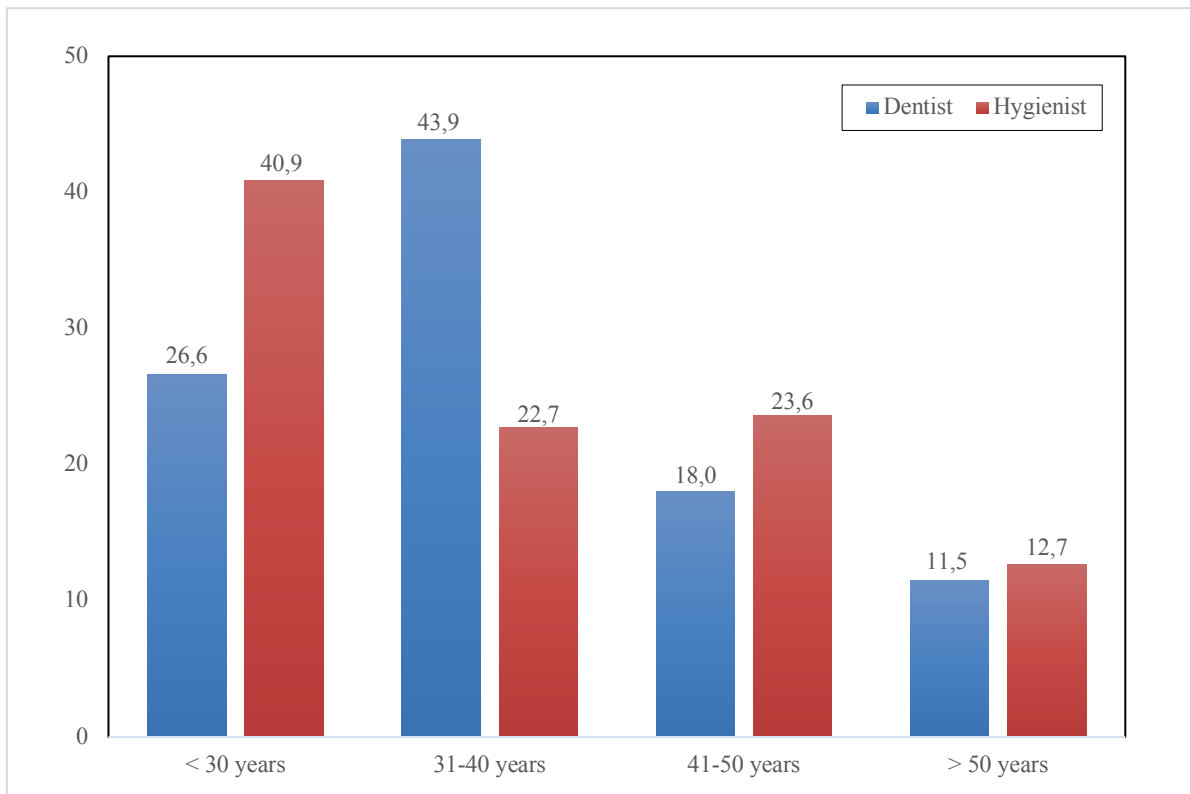


Figure 1 Age distribution (%) of the dentists and the dental hygienists

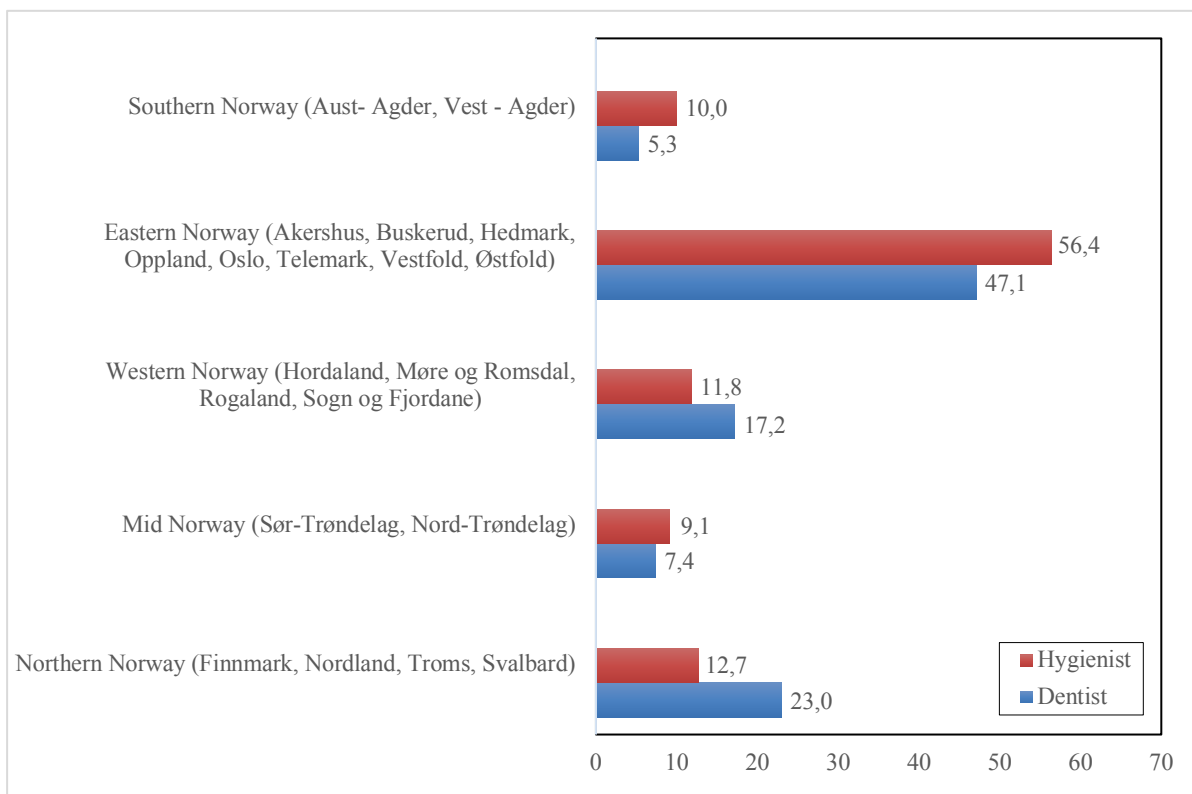


Figure 2 Proportions (%) of dentists and dental hygienists according to the county they practice in

Figure 3 illustrates the difference between the dentists and the dental hygienists when concerning their working sector. More hygienists than dentists were practicing in the public sector (42,7% vs. 34,4%) and more dentists than hygienists in the private sector (58,6% vs. 44,5%) ($p=0,029$).

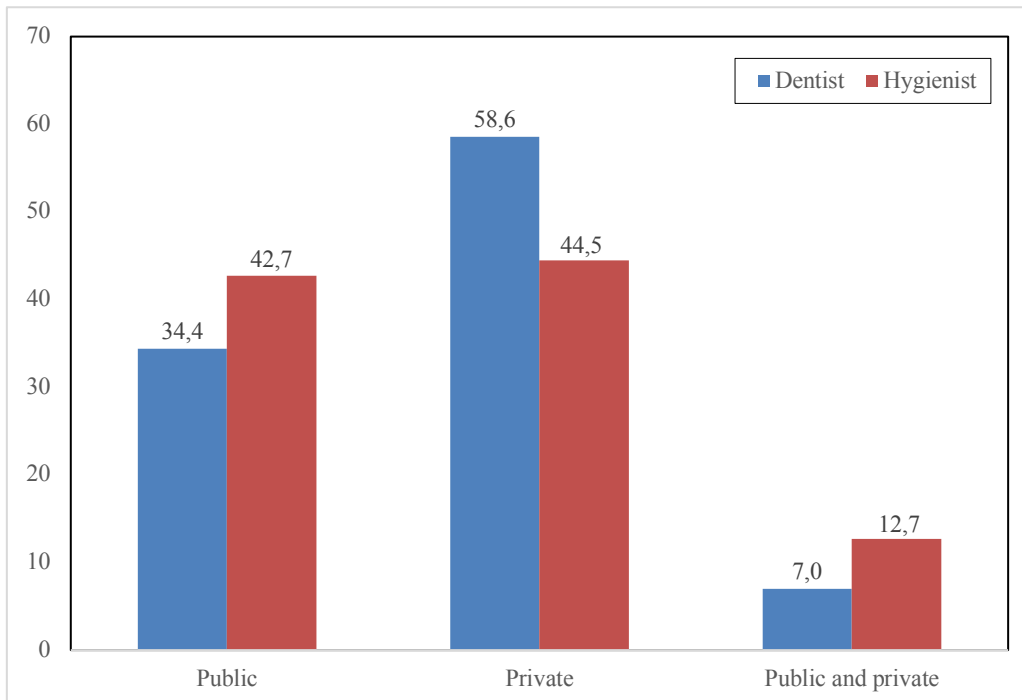


Figure 3 Proportions (%) of dentists and dental hygienists according to the sector they practice in

Most of the dentists (67,2%) and dental hygienists (70,9%) stated that they have never used snus. Significantly more male dentists (44,6%) were current/previous snus users than female dentists (14,7%) ($p<0,001$). Dentists ($p=0,006$) and hygienists ($p=0,002$) who were 30 years or younger used snus currently more often than the other age groups. About every third (30,7%) of young dentists and almost every second (44,5%) of young hygienists were current/previous snus users. Dentists and hygienists over 50 years reported to have never used snus. Significantly more dentists than hygienists reported to never been smoking (76,6% vs. 67,3%), and more hygienists than dentists reported to be current smokers (9,1% vs. 0,8%) ($p<0,001$).

Snus intervention and snus knowledge

Majority of the dentists (88,5%) and dental hygienists (94,5%) agreed that it is the responsibility of the dental personnel to give patients information about snus use and to help

quitting the habit. Only 3,3% of the dentists and 2,7% of the hygienists thought that it is not their duty to perform snus intervention. Remaining respondents said that they do not know.

When seeing signs of snus use in the oral cavity, hygienists reported more often than dentists to ask the patients about their snus habits (84,5% vs. 73,0%; $p=0,010$). Also, when not seeing signs of snus use, hygienists reported more often than dentists to always ask about snus habits (19,1% vs. 9,4%; $p<0,001$). Furthermore, more dentists than hygienists never asked about snus habits (24,2% vs. 6,4%).

The hygienists more often than the dentists recorded their patients' snus habits; 61,8% of hygienists reported to always record, but only 36,1% of the dentists did the same ($p<0,001$). Among dental hygienists, 3,6% reported to never or rarely record their patients' snus habits. The respective percentage among dentists was 13,1.

A significant difference ($p=0,014$) between the dentists and the dental hygienists was found when analyzing how many patients they had instructed in snus invention during the last year (Fig. 4). Dental hygienists reported more often to have instructed more than 50 patients (25,5% vs. 13,5%) and dentists reported more often to have instructed 10 patients or less (27,9% vs. 18,2%).

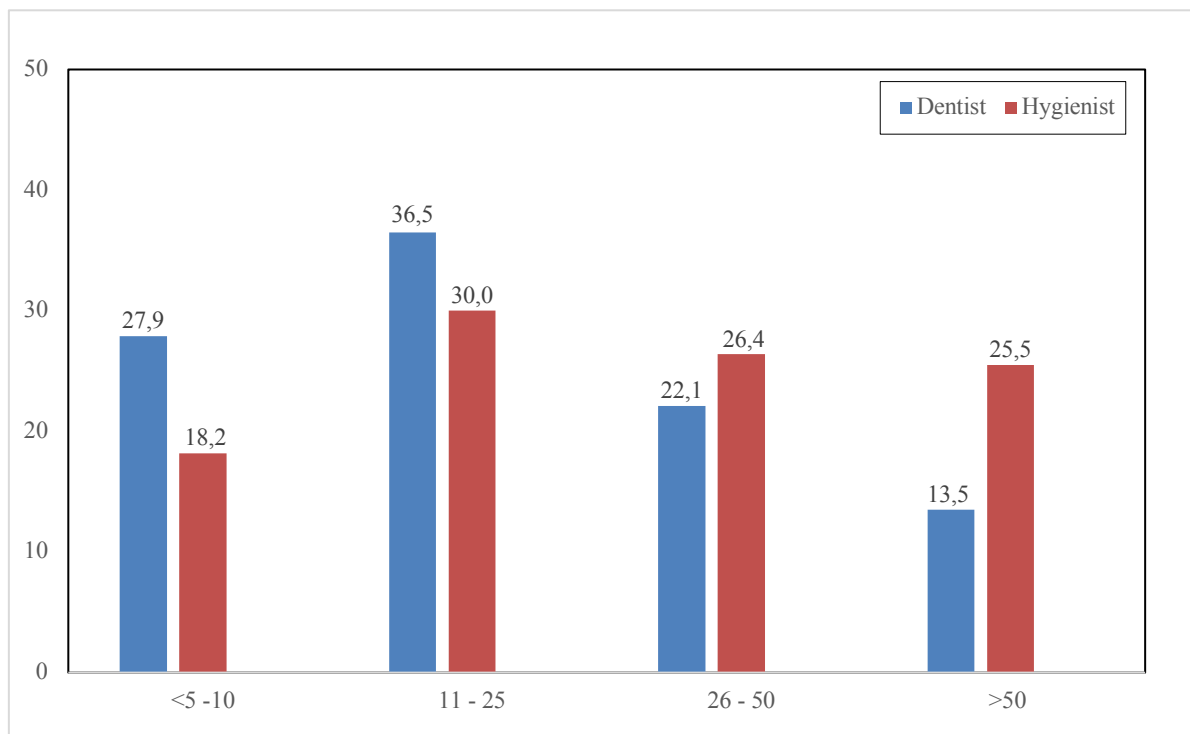


Figure 4 Proportion (%) of dentists and hygienists according to the number of patients they have advised/informed about snus during the last year

There was a significant difference between the working sector and the number of patients the dental professionals had instructed during the last year ($p < 0,001$). Dental personnel working in the public sector compared to the private sector, reported to have guided more often 26-50 patients (24,4% vs. 18,2%) and over 50 patients (20,6% vs. 15,1%) during the last year.

More hygienists than dentists (67,3% vs. 48,8%) reported to have high or very high knowledge level when considering the negative health effects of snus use ($p = 0,009$) (Fig. 5). There was a significant difference ($p < 0,001$) between the knowledge level and how many patients the dentists and dental hygienists had guided during the last year. From those who considered their knowledge to be high or very high, 78,7% reported that they had guided more than 50 patients during the last year. If the knowledge level was lower, the majority (60,2%) reported to have guided 10 patients or less.

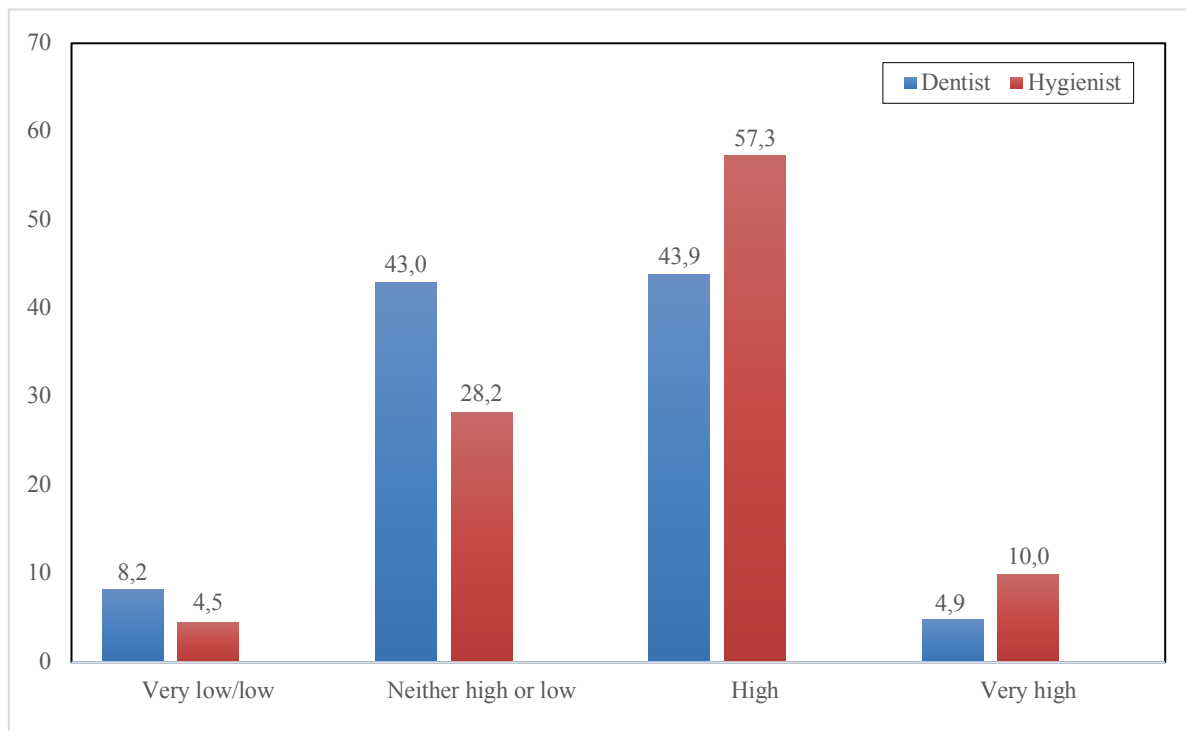


Figure 5 Proportion (%) of dentists and hygienists according to the self-reported level of knowledge concerning harmful health effects of snus use

Snus cessation information availability

There was a significant difference ($p < 0,001$) between the dentists and the dental hygienists when evaluating the availability of information about snus (Fig. 6). The majority (64,3%) of the dentists and a half (50,9%) of the hygienists thought that there was not enough information. About every fifth of both professions replied, “Do not know” (22,5% vs. 18,2%).

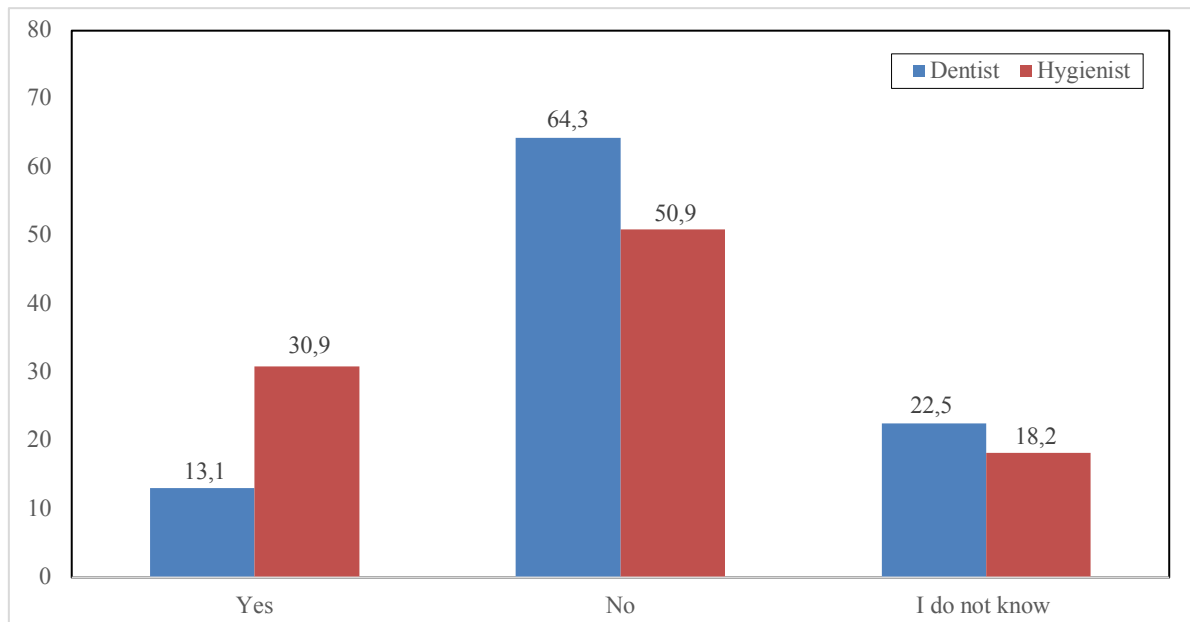


Figure 6 The availability of information (research, guidelines, courses, etc.) about snus according to the professions (%)

Information to the patients about negative health effects of snus use

The dental hygienists reported more often than the dentists to always give information about negative health effects of snus use to the patients who use snus (59,1% vs. 34,4%; $p < 0,001$) (Fig. 7). Dentists gave information more often sometimes, seldom and never, compared to the hygienists (26,6% vs. 9,1%). Female dentists gave information significantly more often than the male dentists ($p < 0,001$). In addition, personal smoking habits among the respondents affected the frequency of information given; dentists ($p = 0,001$) and dental hygienists ($p < 0,001$) who have never smoked gave more often always information compared to the current or previous smokers. There was no significant difference between personal snus habit and giving information about negative health effects of snus.

There was a significant difference ($p < 0,001$) between dentists and dental hygienists concerning information about the specific negative health effects of snus use (Fig. 8). The hygienists reported more frequently than the dentists to always give information concerning: gingival recession (64,5% vs. 40,6%), discoloring (61,8% vs. 32,4%), periodontitis (26,4% vs. 8,2%) and adverse pregnancy outcomes (16,4% vs. 7,0%). More dentists than hygienists informed their patients about periodontitis seldom or never (46,7% vs. 21,8%). There was no statistically significant difference between the dentists and the dental hygienists concerning giving information about cancer. However, dental hygienists reported more often than the dentists to always inform their patients about cancer (29,1% vs. 18,9%; n.s.).

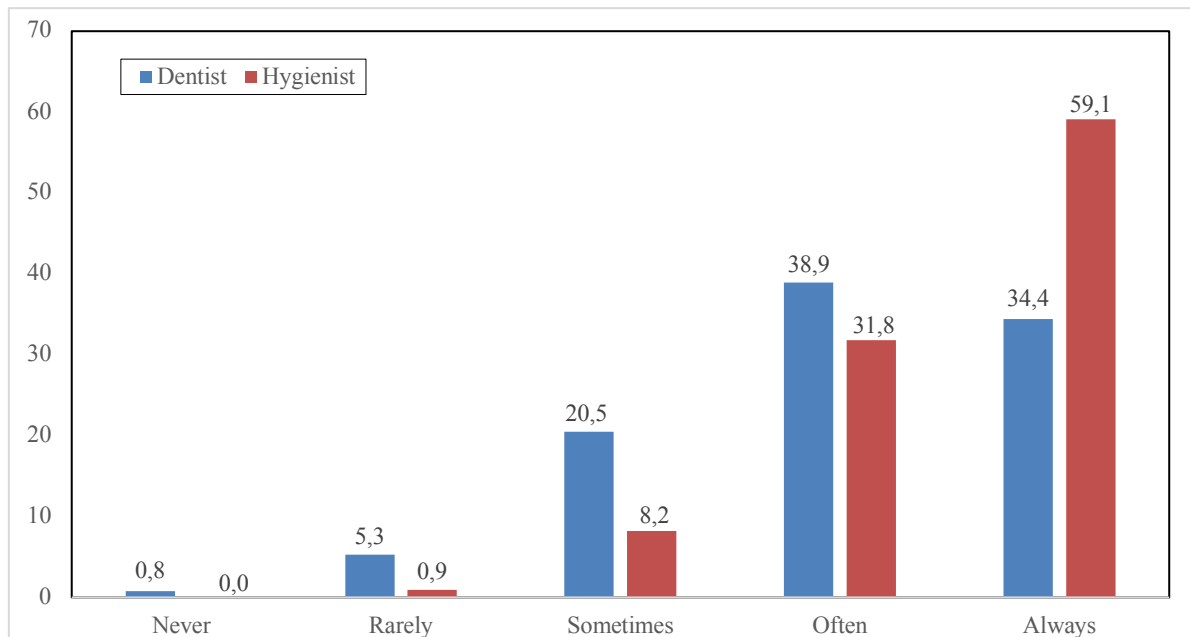


Figure 7 Frequency (%) of how often dentists and dental hygienists give information to their patients who uses snus about the negative health effects

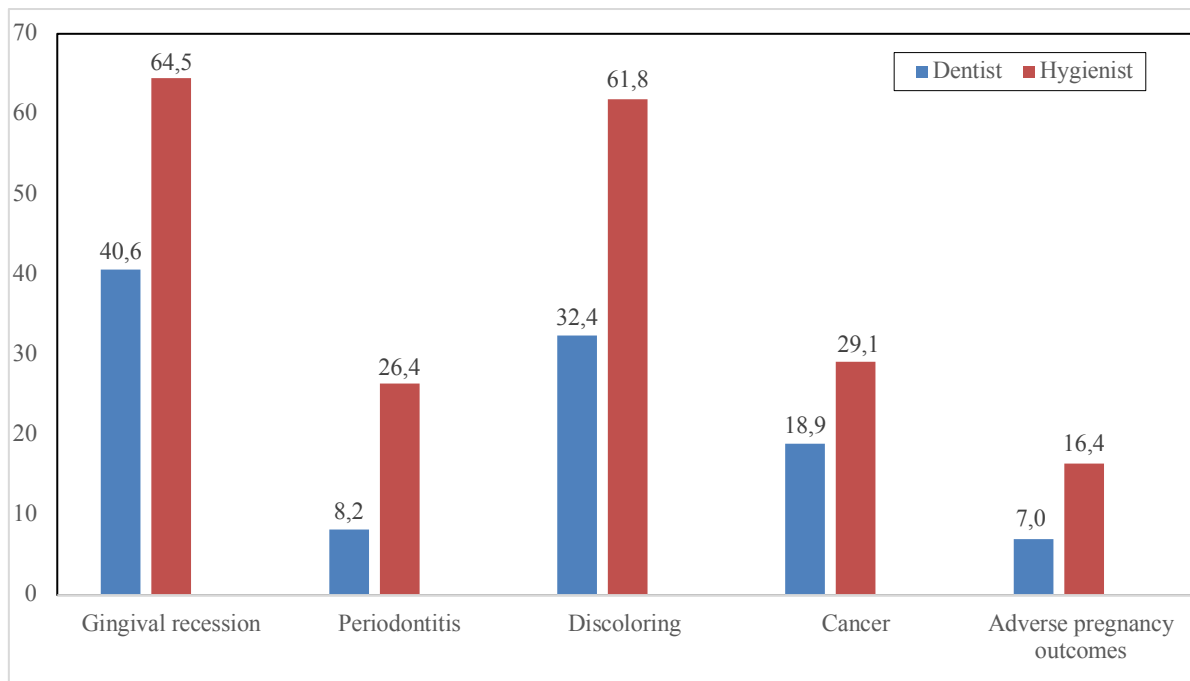


Figure 8 Proportions (%) of dentists and hygienists informing their patients (always) about the negative health effects of snus

The dentists who considered their knowledge level as high compared to those with low knowledge level more often always informed their patients about the following negative health effects: gingival recession ($p=0,030$), discoloration of teeth ($p=0,015$), and cancer ($p<0,001$). Among the hygienists, the similar difference was found for gingival recession ($p=0,031$) and cancer ($p=0,033$).

There was a significant ($p < 0,001$) difference between the dentists and the dental hygienists in how many negative health effects they covered always/often in their snus intervention (Table 1). Hygienists reported to cover 3 (SD=1,2) and dentists 2,4 (SD=1,3) topics in their intervention.

Table 1 The mean number (SD) of topics about negative health effects in snus intervention according to the profession

Profession	N	Mean	SD	SE	95% CI
Dentist/specialist	244	2,4	1,3	0,08	2,24-2,56
Dental hygienist	110	3,0	1,2	0,11	2,77-3,21
Total	354	2,6	1,3	0,07	2,45-2,72

Methods used in snus intervention

The most commonly used method for snus cessation among both professions was recommending the app “Slutta”, the Facebook page “Slutta” and/or slutta.no (Fig. 9). Dental hygienists used more often than dentists the following intervention methods: the app “Slutta”, Facebook page “Slutta” and/or slutta.no (60,9% vs. 48,0%; $p=0,024$), handout brochures (25,5% vs. 12,7%; $p < 0,003$) and conversation measures (49,1% vs. 35,7%; $p=0,017$). Among the dentists and the hygienists, respectively 23,0% and 6,4% reported that they never do snus intervention ($p < 0,001$). Not statistically significant options were: recommending nicotine free snus, nicotine replacement therapy, course in snus and smoking cessation.

The most common reason for not doing any snus cessation was “The patient does not want information/help” (Fig. 10). More hygienists than dentists (88,2% vs. 78,7%; $p=0,033$) reported this as a reason for not practicing snus cessation. The second most common reason was “I do not have enough knowledge about snus”. More dentists than hygienists reported this as a reason for not practicing snus cessation (24,6% vs. 14,5%; $p=0,033$). No significant difference was found between the dentists and the dental hygienists in the following reasons: “It is not economically profitable for me”, “It is an unpleasant topic” and “I do not have enough time”.

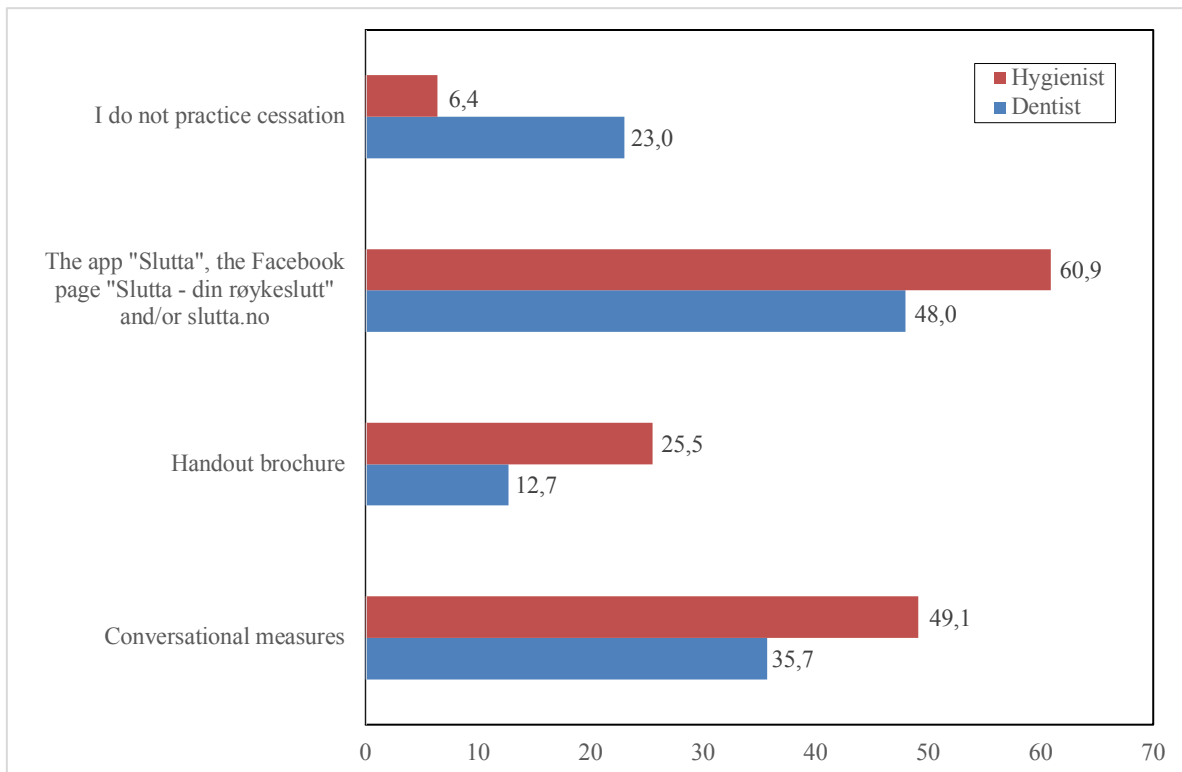


Figure 9 The most common methods recommended (%) to the patients for snus cessation according to the professions. Several options could be selected

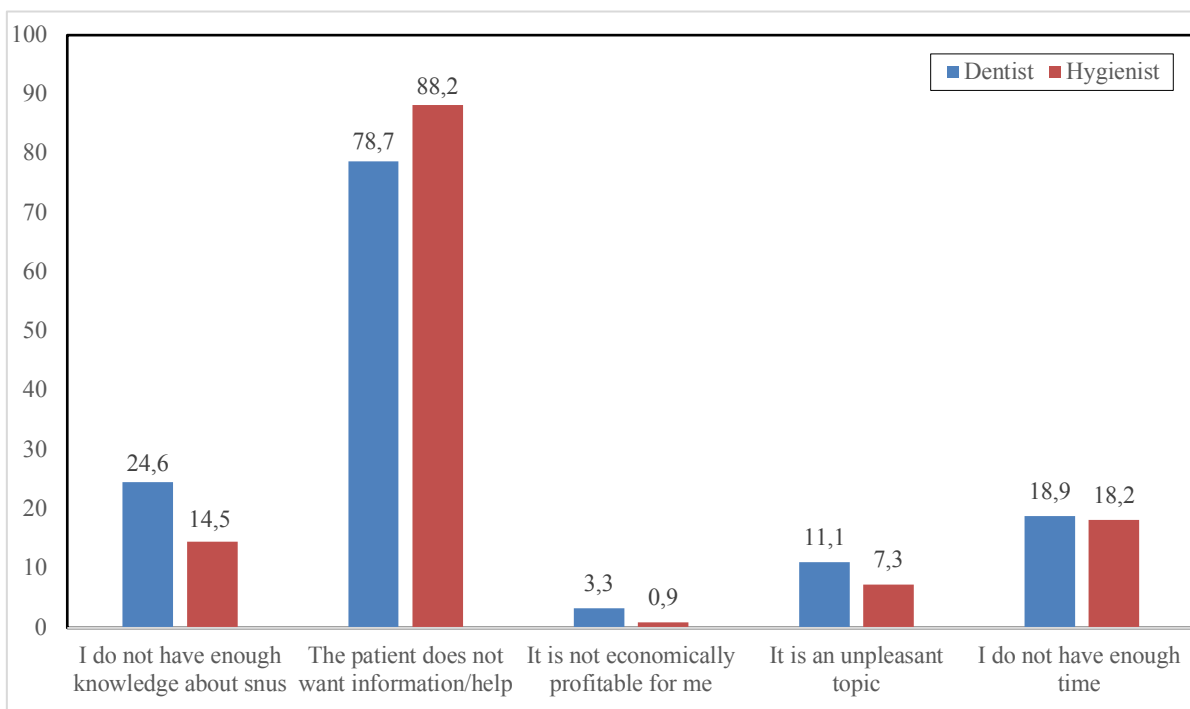


Figure 10 Reasons (%) for not providing information/guidance about snus cessation to the patients according to the professions. Several options could be selected

Snus as a substitute for smoking

More dentists than hygienists would recommend snus as a substitute for smoking (23,8% vs. 4,5%; $p < 0,001$) (Fig. 11). The dentists who had never used snus themselves reported more often not to recommend snus for smoking cessation (82,9% vs. 17,1%; $p < 0,001$). From those dentists who used snus, 56,5% would recommend snus as a substitute for smoking.

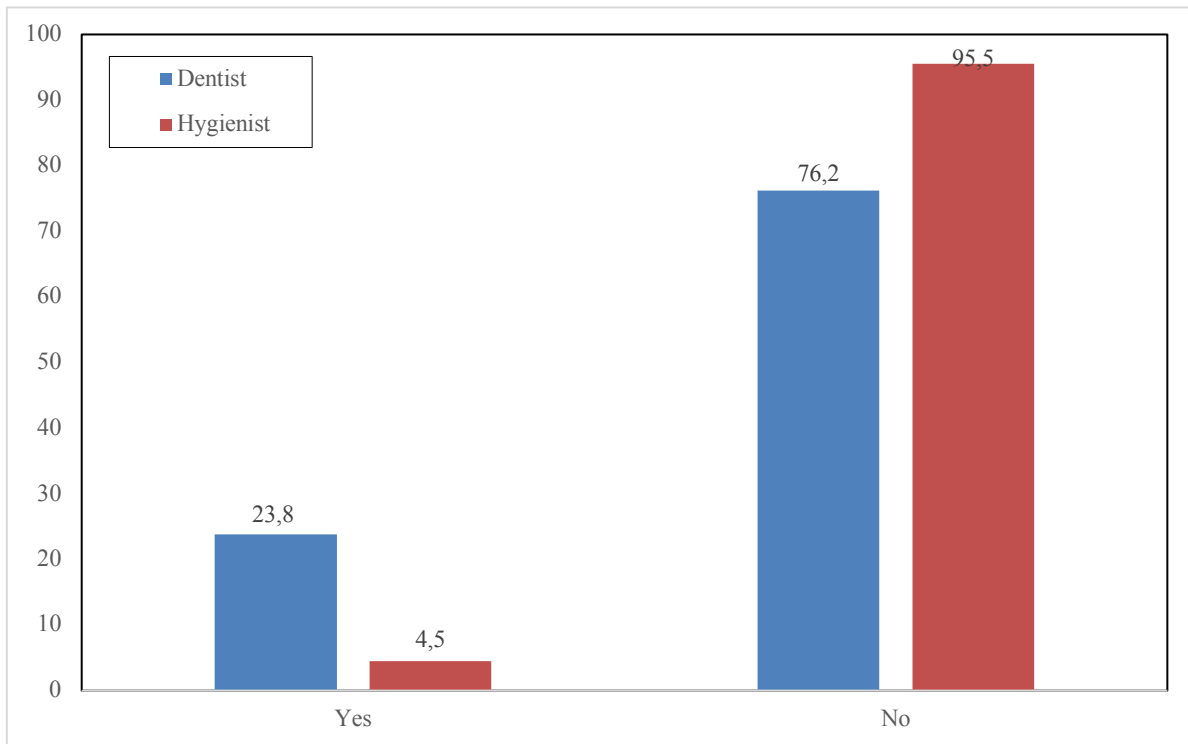


Figure 11 Proportions (%) of dentists and hygienists who recommend snus as a substitute for smoking

Intervention success

The hygienists reported more often than the dentists (59,1% vs. 45,1%) a decrease of snus use among patients, due to their intervention activity ($p < 0,010$) (Fig. 12). The dentists reported more frequently than the hygienists to not inform their patients about snus use (17,6% vs. 5,5%; $p < 0,001$). Only 3,7% of dentists and 2,7% of hygienists believed their patients succeeded in total snus cessation due to their intervention. Furthermore, more female than male dentists believed that their snus invention lead to a success ($p = 0,013$).

The number of patients guided during the last year affected the intervention success. Dentists reported to succeed in intervention more often when they guided 11-25 or 26-50 patients during the last year ($p < 0,001$). Dental hygienists reported to succeed in intervention when they guided 26-50 or over 50 patients ($p = 0,002$). Among dentists who succeeded in total snus cessation, 83,2% always inform their patients about negative health effects of snus use.

Having no success, the respective figure was 68,3% ($p=0,001$). Among hygienists, the difference was even bigger (97,1% vs. 66,7%; $p<0,001$). For both dentists and dental hygienists there was a difference ($p<0,001$) between intervention success and how often they record their patients' snus habit; when always recording, success was more frequent.

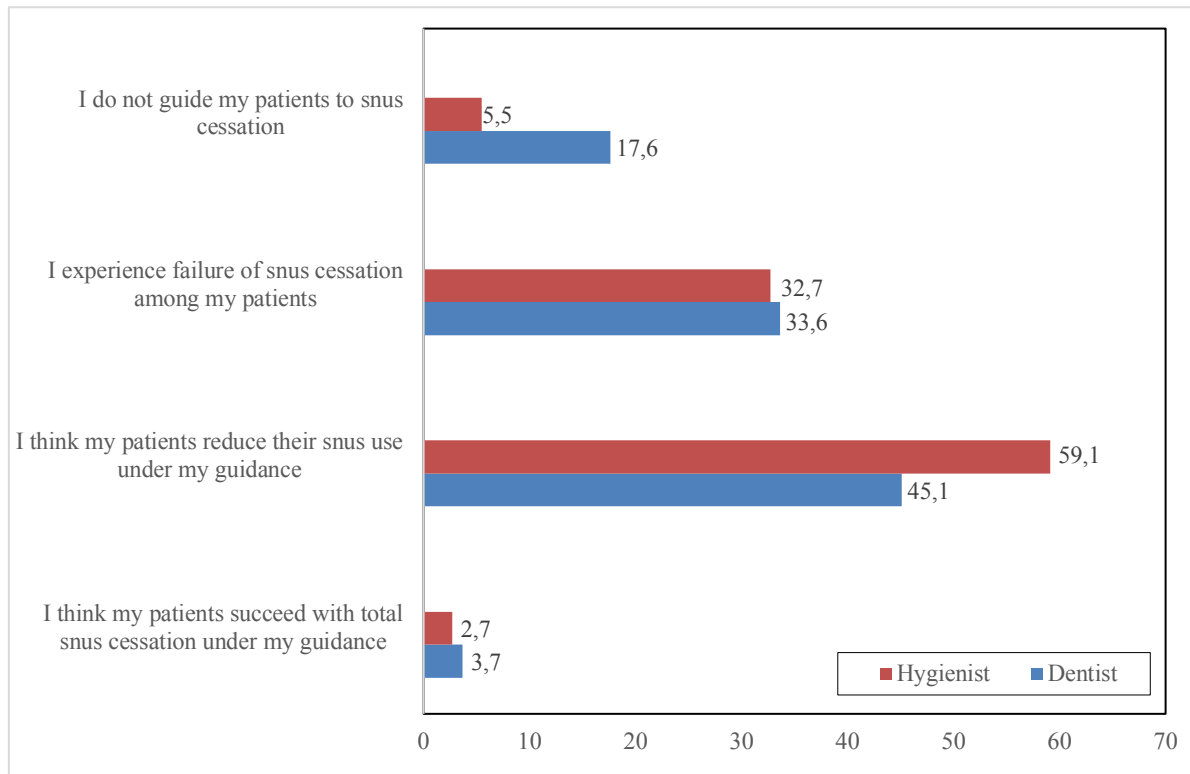


Figure 12 Proportions (%) of dentists and hygienists according to their self-evaluation concerning the snus intervention they give to their patients

Additionally, there was a difference ($p<0,001$) among both professions concerning information given to their snus using patients and intervention success; when always informing their patients about negative health effects of snus use, success was more frequent. Among dentists, high knowledge level versus low knowledge level lead more often to intervention success (68,7% vs. 45,0%; $p=0,020$).

Discussion

In recent years, tobacco smoking has decreased in Norway, but at the same time use of snus has increased. Smoking cessation is a well-adapted practice at dental clinics, but there is very little information concerning snus intervention. With this study, we wanted to map dentists' and dental hygienists' knowledge about snus, the prevalence of snus intervention given and which intervention methods are used. We also wanted to study whether there were differences

between the dentists and the dental hygienists and among the professions. If there were differences, we wanted to detect which factors predict the variation.

The results of our thesis are mostly in line with our suggestions, but there were some parts which did not concur with what we thought. Our first hypothesis was that dental personnel do not have enough knowledge about snus and therefore do not practice cessation, but the results showed that the main reason to not practice snus intervention was because the patients do not want help. The second most common reason, “I do not have enough knowledge”, was in line with our hypothesis. There was also a difference in knowledge level between these professions; dental hygienists rated their knowledge higher than the dentists. We also suggested that dental hygienists practice more snus cessation than dentists, which corresponds with the results, but very few reported to achieve total snus cessation. We also thought that lack of time would determine how often they practice snus cessation, but time did not seem to be an important factor.

Background

We used a structured anonymous online survey, which was published in two Facebook groups during a two-months period. The response rate was lower in the Facebook group for the dentists than for the dental hygienists. The total response rate was quite low (9,5%) despite several reminders. Dental hygienists were more active in participation. More women than men responded to the questionnaire, which match the statistics of the Norwegian Dental Association concerning the gender distribution of their members in 2017 (33). Females also have been shown to use Facebook more often than males (34).

Almost half of the dentists who responded were in the age group of 31-40 years and about the same proportion of dental hygienist were in the age group 30 years or younger. The age distribution among the dentists in our study was quite different compared to total dentist population in Norway. Most of our respondents (70,5%) were younger than 40 years, while the proportion of all dentists at the same age constitutes for only 40% (35). A recent study completed in the U.S. shows that the majority of the social media users is between the ages of 18-29 years (34). This corresponds well with the age, especially of dental hygienists, in our study.

Most of the respondents were working in Eastern Norway (including capital area). Many of the respondents who were currently working in the private sector were in the age group of 41-50 years, and those working in the public sector were younger. Most of the dentists were working in the private sector, and dental hygienist in the public sector. According to a study from 2006, demographic area, the age distribution and working sector among dentists correspond to our results (36).

Dentists reported more often than hygienists that they had never used snus, and more male dentists were current snus users than female dentists. Significantly more young dentists and dental hygienists used snus compared to the older respondents. Concerning snus habits, gender and age distributions are in line with the statistics of the general population in Norway (4, 5).

Snus intervention and snus knowledge

A very few (about 3%) from both dentists and dental hygienists felt that snus cessation was not part of their area of expertise. Results from a previous study showed that about every third dentist and every fifth dental hygienist felt that tobacco (smoking or snus) cessation was outside their field of responsibility (10). It seems that the dental personnel today may feel a greater responsibility than earlier for practicing tobacco cessation. However, the previous study (10) was completed in 2002 when the use of snus was rare among younger people. In addition, the proportion of male dentists in the previous study was much higher than in our study (64% vs. 30%). In both studies, female dentists reported to give more often information about snus use than their male colleagues. Female professionals might feel more often that snus cessation is a part of their duty. However, gender difference seems to have declined since the 2002 study.

More dentists than hygienists reported to never give advice concerning snus use. The most common reason for not doing snus intervention was “The patient does not want information/help” for both professions. Reasons for this may be due to the patient’s autonomy in deciding about their life choices and a lack of knowledge about negative health effects of snus use. If the general knowledge concerning snus would be increased (via mass media, social media etc.), maybe people would be more open for discussing the subject at the dental clinics. The second most common reason for not providing information/guidance on snus

cessation was “I do not have enough knowledge about snus”. About every fifth of both professions did not know if there is enough information available about snus. This highlights a need of more available information and clearer guidelines, although some improvement has already taken place. According to an earlier study (10) common barriers among the dental hygienists was feeling awkward when asking about snus habits, and a lack of knowledge about the effects of snus. Among the dentists, a common barrier was that intervention was considered too time consuming (10). Unlike our hypothesis, our results indicate that lack of time is not a barrier for dentists and dental hygienist to perform intervention. Dental professionals seem to have overcome some barriers for tobacco intervention.

Dental professionals in the public sector reported to guide more patients than those working in the private sector. More hygienists were working at the public sector and were younger than the dentists. While the use of snus has increased quite recently (especially among the younger population), the younger professionals might be more aware of this habit and have more information about it. The dental hygienists reported more often to have high/very high knowledge level about snus compared to the dentists. In the education program for both professions at the Institute of Clinical Odontology, UiT The Arctic University of Norway, the negative health effects of snus use are overshadowed by tobacco smoking and its effects, and are only mentioned shortly during the studies (37).

The higher the knowledge level about snus was, the more patients the hygienists instructed. They reported more often to have instructed more than 50 patients during the last year. A very recent study, which was completed in the Public Dental Service clinics in Norway, confirmed that dental hygienists are more eager to recommend or use all kind of preventive methods (including tobacco/snus intervention) than dentists (38). Children and adolescents (up to 20 years) in Norway belong to the priority groups and are therefore treated by the public sector, while the adults in non-priority groups are mainly treated in the private sector (30). This may be one of the explanations why the public dental personnel in our study reported to do more snus intervention than the private dental personnel. This implies that the snus intervention is targeted to the young people, which hopefully will increase the awareness about negative health effects of snus and will help to stop the increase of snus use in long-term.

Although most dentists and dental hygienists thought that it was a part of their area of expertise to practice snus intervention, clearly more hygienists than dentists reported to give

instructions about negative health effects to their patients. Which contradicts with a previous study (10) where this difference did not exist. According to that study, dental professionals discussed about snus use clearly more often when seeing snus-related damage in the oral cavity. In our study, the dental hygienists instructed their patients about snus use when seeing signs of snus lesions and when not seeing signs. Also, hygienists recorded more often if their patients use snus, which might indicate that dental hygienists are more thorough than dentists in their intervention activity.

Methods used in snus intervention

Among both professions, the most common methods used in snus intervention were the app “Slutta”, slutta.no and the Facebook page “Slutta”. Hygienists reported to use these intervention utilities more often than the dentists. This might be because dental hygienists were younger than the dentists and therefore might be more accustomed to internet and applications. In addition, the dental hygienists were more often working in the public sector, where the youngest patients are the highest priority (30). It is assumed that the younger patients are more familiar with applications of social media than the adult patients; this might be why these methods were recommended mostly in our study.

Every fifth dentist would recommend snus as a substitute for smoking. In a previous study among general practitioners, less than 10% would recommend snus as a substitute for smoking (22). General practitioners would instead recommend nicotine replacement therapy as a strategy. Dentists who were current or former snus users, would more often recommend snus as a substitute for smoking. This is in line with the study among general practitioners, which concluded that those who ranged snus as less harmful than smoking, more often recommended snus as a substitute for smoking (22). Unfortunately, this might be a contributing factor for the increased number of snus users and the negative health consequences that snus causes.

Intervention success

The hygienists reported more often than the dentists that their work and guidance led to a reduction in snus use of their patients. But evaluating a total success, only a very few hygienists and dentists believed that their patients succeeded in snus cessation due to their intervention. This contradicts with the findings of a study completed in the USA, where the

intervention delivered by dentists or dental hygienists clearly increased the number of patients who stopped using smokeless tobacco (39). A reason for this might be because of a more comprehensive intervention strategy and more thorough follow-up of the patients in the American study. Maybe a similar strategy should be introduced to the Norwegian dental clinics for a greater intervention success.

In our study, dentists who considered their knowledge level as high, also reported to be more successful in intervention. There was also a significant difference between reported intervention success and a number of patients treated; the more patients treated, the more success was reported for both professions.

Strengths of the study

One of the strengths of our study was that the questionnaire was filled in anonymously. Therefore, there would be a higher chance that the respondents answer honestly. The questionnaire was short and easy to reply with structured questions, so we assumed that there would be less room for misinterpretations. All the questions had to be answered to be able to complete the survey. Thus, there was no question that had a higher respond rate than the other ones and all questions could be used for the analysis.

Over 300 web survey software products exists (40). We selected the Questback survey software program because it is licensed by UiT, and supports XLS and SPSS, which made data importation, handling and analyzing easy. Electronic surveys are economical for the survey administrator (41). In Dentistry, a web-based survey has been shown to be 2,68 times more cost-effective than a postal questionnaire (42).

The administrators of the Facebook groups published the survey and kept it active for about two months. It has been suggested that for increasing response rate in mailed questionnaires personalized correspondence, reminding mailings and using incentives might be useful (43). A meta-analysis of response rates in Web- or Internet-based surveys (on Public Opinion Quarterly, Journal of Marketing Research and American Sociological Review) found that number of contacts, personalized contacts and pre-contacts was associated with higher response rates (41). In our study, no personal contacts or incentives were used. However, several reminders were sent by the Facebook administrators at the FB pages.

In Facebook, there was a direct link to the Questback questionnaire with no need to use any password. Questback is supported by different browsers. The questionnaire was short and did not contain sensitive topics. It had a user-friendly design with one question per page and moving to the next question was performed by clicking “next”. Electronic surveys are shown to be quite easy to complete and can be completed wherever and whenever the respondents choose, which would give an impression that more people would respond in online surveys than in the non-electronic ones (41).

Limitations of the study

The most important limitation of our study was a low response rate. Only 7,9% of the dentists and 16,3% of the dental hygienists in their respective Facebook groups replied. One reason for this low response rate might have been the platform used for delivering the questionnaire. The Norwegian Dental Association did not release personal information such as e-mail or mail addresses of their members. In a smoking intervention study completed in 2015, a survey link was sent by e-mails to 4 166 members of the Norwegian Dental Association (44). Although having personal correspondence with the dentists, the response rate was quite low, 36,3%. An American study (42) used the same method and reached a response rate of only 11%.

Due to having no access to the e-mails, we decided to use Facebook to simplify the process for us and for the respondents. It would have been very time consuming to call or contact by e-mail all dental practices in Norway and ask the head of the clinics whether they would be willing to participate and distribute the questionnaire at their clinics. We assumed that a high number of dentists and dental hygienists could be approached via the Facebook groups “Oss tannleger i mellom” and “Oss tannpleiere i mellom”. The group for dentists had 3 045 members and the group for dental hygienists had 686 members at the point when the questionnaire ended. According to the Statistics Norway in 2016, 4 470,8 dentists (full-time equivalents), 956,9 dental hygienists and 457,9 dental specialists were registered. The majority of the dentists (68,1%) and of the hygienists (71,7%) are members of their FB groups (45). In our study, number of the dentists who replied counts for 5,4% from the total number of dentists practicing in Norway. The respective percentage for the dental hygienists was 11,5%. Thus, our results cannot be generalized to the whole population of the dental professionals. However, it has been shown that those who reply to the web surveys have a

higher conscientiousness than non-respondents (46). We might suspect that our respondents were especially interested in snus and snus cessation, had more knowledge about snus and perform snus intervention more often than the non-respondents. Therefore, awareness and intervention activity might be even lower, which highlights a greater need for increasing the knowledge level and for clearer guidelines. To confirm our results, a survey with a more representative sample would be needed. This might be gained if the professional organizations could complete it together. Our study was based on the self-reported results which, according to a previous study, might cause recall bias (10). More reliable data about snus intervention activity could be collected from the patients' records. This would lead to more representative results although being very time consuming and costly.

Looking back at the questionnaire we see some questions we would have changed and some we would have added. One thing we regret not asking about was in which country they studied and what university they graduated from. There might be differences between the ones who have graduated abroad due to a lack of snus users, and maybe there are differences between the educational establishments in Norway as well. In addition, to confirm if the adolescents/young adults have been targeted in the public sector, we should have asked the mean age of the patients dentists and dental hygienists have instructed about snus. In the question about which negative health effects of snus the dental professionals inform the patients about, we should not have asked about periodontitis due to a lack of studies showing correlation between snus use and periodontitis. Instead we should have included diabetes or increased fatality after cardiac disease as negative health effects. Instead of mentioning "cancer" as negative health effect of snus use, we could have been more specific and included the cancer sites associated with snus use. In the question concerning method used in snus cessation, we also should have included contacting general practitioner for prescription of nicotine replacement product to the patients. We should also have included a question about dentists' and dental hygienists' opinion concerning relative harmfulness of snus compared to smoking. It would be very important to have a common consensus about snus, to avoid distrust against the health professions and skepticism about the message concerning tobacco.

Conclusions

The clear majority of the dentists and dental hygienists in our study considered that it is their duty to practice snus cessation. The results showed that dental hygienists reported to succeed with snus cessation more often than the dentists. They also reported to have a higher knowledge concerning snus and the negative health effects of snus use compared to the dentists. Both dentists and dental hygienists considered that there is not enough information available about snus for dental personnel. Based on these results, we would like to highlight the need for an increased focus on snus and clearer guidelines for snus intervention in the dental clinics.

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Appendix 1

Intervensjon ved snusbruk hos tannhelsepersonell

Er snus den nye røyken?

Til tross for store uenigheter blant forskere og at noen langtidseffekter fortsatt er uklare - økt bruk av snus i befolkningen er et faktum. Hvordan håndterer tannhelsepersonell problematikken?

Vi er tre tannlegestudenter ved UiT Norges Arktiske Universitet som i forbindelse med vår masteroppgave ønsker å kartlegge vanene til Norges tannhelsepersonell angående informasjon om snus og tilbud om snusavvenning til sine pasienter.

Funnene fra undersøkelsen vil forhåpentligvis kunne bidra til å belyse dette dagsaktuelle temaet. Undersøkelsen tar ca. 5 minutter og det er frivillig å delta.

Om du har spørsmål angående spørreundersøkelsen eller ønsker mer informasjon kan du kontakte oss på:

kkv015@post.uit.no

Veileder: Prof. Sisko Honkala (sisko.l.honkala@uit.no)

Med vennlig hilsen

Alexandra Kverneng

Julie Børnich Rustad

Katrine Kvitvær

Din identitet vil holdes skjult.

1) Hva er ditt kjønn?

- Mann
- Kvinne

2) Hva er din alder?

- Under 25 år
- 25 - 30 år
- 31- 40 år
- 41- 50 år
- 51- 60 år
- Mer enn 60 år

3) Hvilken landsdel praktiserer du i per dags dato?

- Nord-Norge (Finnmark, Nordland, Troms, Svalbard)
- Trøndelag (Sør-Trøndelag, Nord-Trøndelag)
- Vestlandet (Hordaland, Møre og Romsdal, Rogaland, Sogn og Fjordane)
- Østlandet (Akershus, Buskerud, Hedmark, Oppland, Oslo, Telemark, Vestfold, Østfold)
- Sørlandet (Aust-Agder, Vest-Agder)

4) Hva praktiserer du som?

- Tannlege
- Tannpleier
- Spesialist

5) Hvilken sektor praktiserer du i per dags dato?

- Offentlig
- Privat
- Kombinert offentlig og privat

6) Hvor lenge har du praktisert ditt yrke?

- Under 1 år
- 1 - 5 år
- 6 - 10 år
- 11 - 20 år
- 21 - 30 år

- 31 - 40 år
- Mer enn 40 år

7) Hva er dine snusvaner?

- Fast bruker
- Tidligere bruker
- Bruker av og til
- Aldri brukt

8) Hva er dine røykevaner?

- Fast bruker
- Tidligere bruker
- Bruker av og til
- Aldri brukt

9) Hvordan anser du ditt kunnskapsnivå om helseskadelige effekter ved bruk av snus?

- Svært lavt
- Lavt
- Verken lavt eller høyt
- Høyt
- Svært høyt

10) Hvor mange pasienter har du veiledet/informert om snus det siste året?

- 0
- 5 – 10
- 11 – 25
- 26 – 50
- Mer enn 50

11) Hvilken av følgende påstander er du mest enig i?

- Jeg opplever at mine pasienter lykkes med total snusavvenning under min veiledning
- Jeg opplever at mine pasienter reduserer snusbruk under min veiledning
- Jeg opplever å ikke lykkes med snusavvenning hos mine pasienter
- Jeg veileder ikke mine pasienter til snusavvenning

12) Når du IKKE ser tegn til snusbruk i munnhulen, hvor ofte spør du pasienten om de snuser?

- Aldri
- Sjeldent
- Noen ganger
- Ofte
- Alltid

13) Når du ser tegn til snusbruk i munnhulen, hvor ofte spør du pasienten om de snuser?

- Aldri
- Sjeldent
- Noen ganger
- Ofte
- Alltid

14) Hvor ofte journalfører du snusbruk hos pasienter?

- Aldri
- Sjeldent
- Noen ganger
- Ofte
- Alltid

15) Gitt at pasienten snuser. Hvor ofte gir du informasjon om negative helseeffekter ved å snuse?

- Aldri
- Sjeldent
- Noen ganger
- Ofte
- Alltid

16) Hvor ofte informerer du pasienter som snuser om følgende

	Aldri	Sjeldent	Noen ganger	Ofte	Alltid
Gingival retraksjon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Periodontitt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Misfarging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kreft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fosterlivsskader ved graviditet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17) Hvilke av følgende metoder/hjelpemidler anbefaler du dine pasienter for snusavvenning (flere svaralternativ kan velges)?

- Samtaletiltak (motiverende intervju, samtaleguiden "Snakk om snus- og røykeslutt")
- Kurs i snus- og røykeslutt (kursmal "Tobakksfri")
- Utdeling av brosjyre
- Slutta-appen, Facebooksiden Slutta - din røykeslutt og/eller slutta.no
- Nikotinlegemidler (Nicorette[®], Nicotinell[®], Zonnic[®])
- Nikotinfri snus
- Jeg driver ikke med snusavvenning

18) Ville du anbefalt snus som substitutt for røyk ved ønske om røykeslutt?

- Ja
- Nei

19) Hvis du unnlater å gi informasjon/veiledning om snusavvenning til en pasient, hva er de vanligste årsakene (flere svaralternativ kan velges)?

- Jeg har ikke tilstrekkelig kunnskap om snus
- Jeg har ikke nok tid
- Det er ikke økonomisk lønnsomt for meg
- Det er et ubehagelig tema
- Pasienten ønsker ikke informasjon/hjelp

20) Mener du det er innenfor tannhelsepersonellets fagfelt å gi informasjon / tilby hjelp til avvenning til pasienter som snuser?

- Ja
- Nei
- Vet ikke

21) Mener du det er tilstrekkelig informasjon (forskning, retningslinjer, tilbud om kurs osv.) om snus tilgjengelig for tannhelsepersonell?

- Ja
- Nei
- Vet ikke

22) Har du noe annet du vil tilføye undersøkelsen?

Appendix 2

Snus intervention among dental personnel

Is snus the new cigarette?

Despite huge disagreements among scientists and that long-term effects still are unclear – an increased use of snus in the population is a fact. How does the dental personnel manage the problem?

We are three dental students from the UiT The Arctic University of Norway that with our thesis wishes to map the Norwegian dental personnel's habits regarding information about snus and intervention activity among their patients.

Our results will hopefully contribute to enlighten this current topic. The survey takes about 5 minutes and it is voluntary to participate.

If you have any questions regarding the survey or want more information, you can contact us at:

kkv015@post.uit.no

Supervisor: Prof. Sisko Honkala (sisko.l.honkala@uit.no)

Best regards,

Alexandra Kverneng

Julie Børnich Rustad

Katrine Kvitvær

Your identity will not be recognized.

1) What is your gender?

- Male
- Female

2) What is your age?

- Less than 25 years
- 25 - 30 years
- 31 - 40 years
- 41 - 50 years
- 51 - 60 years
- More than 60 years

3) In which county do you practice today?

- Northern Norway (Finnmark, Nordland, Troms, Svalbard)
- Mid Norway (Sør-Trøndelag, Nord-Trøndelag)
- Western Norway (Hordaland, Møre og Romsdal, Rogaland, Sogn og Fjordane)
- Eastern Norway (Akershus, Buskerud, Hedmark, Oppland, Oslo, Telemark, Vestfold, Østfold)
- Southern Norway (Aust-Agder, Vest-Agder)

4) What is your profession?

- Dentist
- Dental hygienist
- Specialist

5) In what sector do you practice in today?

- Public
- Private
- Combined public and private

6) How long have you practiced in your profession?

- Less than 1 year
- 1 - 5 years
- 6 - 10 years
- 11 - 20 years
- 21 - 30 years

- 31 - 40 years
- More than 40 years

7) What are your snus habits?

- Current user
- Former user
- Uses sometimes
- Never used

8) What are your smoking habits?

- Current user
- Former user
- Uses sometimes
- Never used

9) How do you consider your level of knowledge about harmful effects of using snus?

- Very low
- Low
- Neither high or low
- High
- Very high

10) How many patients have you advised/informed about snus in the last year?

- 0
- 5 - 10
- 11 - 25
- 26 - 50
- More than 50

11) Which of the following statements do you agree the most?

- I think my patients succeed with total snus cessation under my guidance
- I think my patients reduce their snus use under my guidance
- I experience failure of snus cessation among my patients
- I do not guide my patients to snus cessation

12) When you do NOT see signs of snus use in the oral cavity, how often do you ask the patients if they use snus?

- Never
- Rarely
- Sometimes
- Often
- Always

13) When you do see signs of snus use in the oral cavity, how often do you ask the patients if they use snus?

- Never
- Rarely
- Sometimes
- Often
- Always

14) How often do you record your patients' snus use?

- Never
- Rarely
- Sometimes
- Often
- Always

15) Given that the patient uses snus, how often do you give information about negative health effects due to snus use?

- Never
- Rarely
- Sometimes
- Often
- Always

16) How often do you inform about the following topics:

	Never	Rarely	Sometimes	Often	Always
Gingival recession	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Periodontitis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discoloring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adverse pregnancy outcomes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17) Which of the following methods/tools do you recommend your patients for snus cessation (multiple options can be selected)?

- Conversational measures (motivational interview, conversational guide “Talk about snus and smoking cessation”)
- Course in snus and smoking cessation (“Tobacco free”)
- Handout brochure
- The app “Slutta” (Quitting-app), the Facebook page “Slutta - din røykeslutt” and/or slutta.no
- Nicotine replacement therapy (Nicorette[®], Nicotinell[®], Zonnic[®])
- Nicotine free snus
- I do not practice cessation

18) Would you recommend snus as a substitute for tobacco smoking if the patient wants to stop smoking?

- Yes
- No

19) If you do not provide information/guidance on snus cessation to the patient, what are the main causes (multiple options can be selected)?

- I do not have enough knowledge about snus
- I do not have enough time
- It is not economically profitable for me
- It is an unpleasant topic
- The patient does not want information/help

20) Do you think it is within the dental professionals' field of expertise to provide information / offer help to cessation to patients who uses snus?

- Yes
- No
- I do not know

21) Do you think there are sufficient information (research, guidelines, courses, etc.) about snus available to dental personnel?

- Yes
- No
- I do not know

22) Is there anything else you would like to add to the survey?