Oral treatment need and oral treatment intention in a population enrolled in long-term care in nursing homes and home care

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The aim of the study was to evaluate the realistic oral treatment need in a population in southern Sweden enrolled in long-term care (LTC), in nursing homes (NH), or home care (HC), taking into consideration treatment intention. Every third individual enrolled in LTC was selected after proportionally stratifying a total of 866 subjects according to gender. Of these, 732 (85%) were available for a simple clinical oral health evaluation in their own homes. Dental status, oral mucosal status, oral hygiene status, oral mucosal inflammation, and oral mucosal friction were assessed by observational examinations; suspected malignancies were also noted. Oral treatment need was expressed in accordance with the Treatment Need Index (TNI) as no, minor, major, or urgent, while treatment intention was expressed in accordance with the Treatment Intention Index (TII) as the aim to relieve, delay, maintain, or improve. The rationale for using the TII is to offer subjects in this generally frail population oral treatment at an appropriate level, taking their medical condition into consideration. It was found that 61% of the sample had a need not just for an oral health evaluation but also for additional dental treatment, 31% to be accomplished by prophylactic and 30% by reparative or emergency measures; only 1% were estimated to be in urgent need. Furthermore, one manifest and one suspected oral malignancy were found. The results indicate that realistic oral treatment need, guided by the examiner's estimation of the appropriate treatment intention, is modest in this population, but that regular oral screening is mandatory. □ *Epidemiology; long-term care; oral health status; oral treatment intention; oral treatment need*

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In the Swedish population, as well as in the populations of most industrialized countries, the demographic pattern is changing and the proportion of elderly persons >65 years is constantly increasing. Almost all of this increase in the elderly is in the number >80 years of age (1). This aging of the population presents a challenge to the healthcare organization, the oral healthcare organization included. In Sweden, as well as in most other Western countries, oral health has been improving continuously (2–4). This is true also for the age group >65 years (5–8). Consequently, the prevalence of edentulousness has been decreasing steadily, and currently less than 10% of the Swedish population are edentulous (9–12). However, considerable regional differences are still reported (9, 11, 13).

Since the introduction of National Dental Health Care Insurance in 1974, oral health improvement in Sweden has been accompanied by an increased utilization of dental care (14). This is most pronounced among persons >65 years of age owing to greatly improved economic support through dental insurance (5, 11, 13). The improved oral health among the elderly is of course positive, but at the same time it constitutes a certain risk, high age implying an impaired ability for self-care. Without proper assistance, the result may be rapid deterioration of the oral condition, especially among dentate subjects. Although the elderly in Sweden, in general, are high dental utilizers (7, 15), there is still a considerable number of non-utilizers. Most of these consider themselves as having 'no perceived need', but there are also those with feelings of loneliness and functional impairment (16). However, attitudes concerning the importance of retaining one's own natural teeth have been shown to be independent of age, and related more to the number of remaining own natural teeth (17).

Oral health is described mainly by the number of remaining own teeth and the prevalence of caries and periodontitis. In an elderly population, an increasing prevalence of tooth loss, root caries and periodontal disease has been observed with age (13), even if there is a tendency towards less progression (18). The increasing number of remaining own teeth, many with both complex and extensive prosthetic restorations, has resulted in an increasing treatment need, despite a high level of dental utilization (19). It therefore appears mandatory to offer assistance to persons with impaired capacities and unable to maintain adequate oral hygiene. One way to accomplish this is to perform regular oral health screening primarily among those enrolled in long-term care (LTC), as prescribed in the new Swedish Dental Health Care Insurance (20).

A number of clinical examination protocols have been developed for assessing oral health in an impaired population (21–38), focusing on the urgency of treatment

need, the propensity for treatment, a brief evaluation of oral health, the screening of oral hygiene, oral function, and on realistic need.

Sweden has a system for LTC that is peculiar in some respects. All LTC is publicly financed, but some care facilities are privately operated in free competition. Besides this, the next of kin can also be gainfully employed caring for their relatives. LTC comprises mainly the elderly, but there are no set age limits; medical and social needs are decisive factors for being enlisted. When screening this population, to a considerable extent daily dependent on municipal care or next of kin, the fact that they are frail has to be taken into account (29). In addition, diseases and medication may have a negative impact on oral health (30–33). People with impaired capacities may not give first priority to oral health problems (34, 35), making it important for the professionals to focus on the realistic treatment need, estimating the 'true need for treatment' among the institutionalized persons (36).

A new regulation introduced in 1999 within the Swedish National Dental Health Care Insurance stipulates economic support to persons, who, due to disease or handicap, are permanently dependent on aid from nursing personnel in their daily life (20). This support is intended for those receiving LTC either living in nursing homes (NH) or within municipal care in their own dwellings (home care = HC) with assistance from mobile nursing personnel or from paid relatives. However, the regulation stipulates that within HC enrolment in the LTC is not sufficient. A further requirement is that there should be a permanent, extensive daily need for care for those entitled to examination and to necessary dental care. Being enrolled in such care entitles care receivers to an annual, free-of-charge, oral health examination on a voluntary basis. This population group is also entitled to receive what is considered necessary dental treatment on the same economic terms as medical treatment, with a set, low fee, regulated and funded by the county council.

According to Jokstad et al. (18), the allocation of increased treatment resources to subjects within LTC facilities is necessary if dental decay is to be prevented. However, in Sweden, little is known about the current oral health situation in this population group, and consequently the need for appropriate treatment resources.

The aim of this study was therefore to analyze the realistic oral treatment need in a sample of persons enrolled in municipal LTC, with special emphasis on treatment intention. The relations between the examiner's judgements of need and intention are also investigated controlling for dental status, age, gender, and housing category.

Material and methods

Study sample

The study was performed in three municipalities in the county of Halland, Sweden, with a total population of about 118,000 belonging to both urban and rural areas. Of the approximately 280 municipalities in Sweden, those chosen are relatively large; 2600 persons were registered as in need of either institutional LTC (1854 persons, NH group) or corresponding care in their own dwelling (746 persons, HC group), constituting the population for the sample. Lists of NH and HC residents provided by the different LTC districts were rendered similar in structure by being organized in accordance with age, gender, and type of LTC. Every third person was then selected for the sample (a total of 866) and offered the opportunity to participate in an oral health evaluation. This procedure rendered a proportionally stratified random sample representative of the population in the three municipalities. Of those selected (231 men and 501 women), 618 belonged to the NH group, the remaining 248 to the HC group. Representativity of the sample was controlled by calculating the proportion of the sample living in HC with the true proportion in the studied municipalities, according to official registers. The result was $248/866 = 0.29$ and $746/2600 = 0.29$, respectively.

A LTC population is generally frail. Some die, others are hospitalized and some are moved between caring units and caring forms in the time elapsing between acquisition of the list of residents and examination day. Consequently only 732 (85%) were available for examination (aged 83 ± 9 years, mean $\pm$ *s* (SD)), 530 persons within NH and 202 within HC. Of the 134 (15%) who dropped out, 27 (8 men and 19 women aged 87 ± 7 years, mean $\pm$ *s*) had died before the examination took place (22 within NH and 5 within HC). Of the remaining 107 persons not participating (aged 79 ± 12 years, mean $\pm$ *s*), a quarter were men and three-quarters were women; 19 were within hospital service (7 within NH and 12 within HC); 25 had moved (13 subjects from HC to NH); 3 declined due to disease; 43 did not want to participate for other reasons; 11 were not at home, and 6 were wrongly categorized. Drop-outs were not replaced, since this did not affect the representativity of the examined sample. The relation NH/HC was 2.6 in the examined sample and 2.5 in the population.

Discussion with the personnel in charge of the different homes or regions preceded the examination. Consent was mediated through the personnel after asking the care receivers. Written information about the new dental health law, including the offer of a free-of-charge examination, was sent to each selected subject. In this letter, an appointment time was suggested to the subject. A telephone number was given enabling the subject, their next of kin, or nursing personnel to contact the research team.

Examination protocol

Oral health was estimated by means of a validated protocol used in previous studies (27, 28). This protocol forms the basis for epidemiological reports concerning the

Table 1. Treatment intention index (TII) describing the examiner's judgement of the different levels of treatment aim and intention

Level	Aim	Treatment intention
Emergency care	To relieve	To relieve pain and eliminate infections.
Palliative care	To delay	Comparatively severe symptoms of oral disease are accepted, as is aggravation, but not acute pain and/or inflammation.
Limited care	To maintain	To maintain comparatively good oral health. Minor symptoms of oral disease are accepted, but not aggravation.
Comprehensive	To improve	To achieve full oral health. Symptoms of oral disease are not accepted.

outreach activities among persons in the county of Halland, according to the new paragraph in the Swedish National Dental Insurance (20). The protocol (25, 27, 28) evaluates dental status, oral mucosal status, oral hygiene status, oral mucosal inflammation, and dry mouth, which was recorded by means of a mucosal friction index (MFI) as described in a previous publication (37).

Number of teeth is a coarse indicator of oral health, but is used extensively (13, 15, 38). Dental status was therefore registered as the number of remaining teeth/residual roots and the presence of fixed and removable dentures. The presence of implants was noted, too.

Oral mucosal status (6 items) was recorded as the presence or absence of oral mucosal color changes, wounds and/or blisters, and hyperplasias. Changes in the mucosa of the tongue and palate were estimated separately, the lingual mucosa as normal, atrophic, or with other changes; the palatal mucosa as normal, with local or general inflammation, or with other changes. In addition, suspected malignancies were recorded.

Oral hygiene status was estimated on a four-level scale as good, acceptable, less good, or bad (21, 25): 'good' indicating good oral hygiene, with absence of visible plaque on teeth or dentures; 'acceptable' indicating acceptable oral hygiene, with negligible accumulation of plaque; 'less good' indicating less good oral hygiene, with moderate accumulation of plaque; 'bad' indicating bad oral hygiene, with abundant amount of plaque.

Oral mucosal inflammation, expressed as mucosal index (MI), was estimated on a four-level scale as no inflammation, mild inflammation, moderate inflammation, and severe inflammation (21, 25): 'no inflammation' indicating normal appearance of the gingiva and the oral mucosa; 'mild inflammation' indicating slight changes in color and/or form of the gingival and/or slightly red keratinized mucosa, including red spots indicating inflamed salivary duct orifices; 'moderate inflammation' indicating marked redness and edematous gingiva, bleeding easily when pressure is applied, and/or marked redness of keratinized mucosa and/or salivary duct orifices and/or ulceration(s) caused by denture(s) and/or hyperplasias caused by denture(s); 'severe inflammation' indicating severe redness with severe gingival swelling, spontaneously bleeding gingiva and/or severely red and edematous palatal mucosa; additionally proliferations, inflamed hyperplasias or bleeding oral mucosa.

Dry mouth was recorded by means of the mucosal friction index (MFI), described earlier as no, some, and obvious dryness (37): 'no dryness' indicating absence of friction between the dental mirror and the buccal mucosa; 'some dryness' indicating some friction between the dental mirror and the buccal mucosa, but no tendency of the mirror sticking to the buccal mucosa; 'obvious dryness' indicating obvious dryness between the dental mirror and the buccal mucosa, the mirror sticks or tends to stick to the buccal mucosa.

The examinations were performed using simple measurements (a gloved hand, a dental mirror, and a portable light), a necessity taking into account the circumstances under which the examination was performed. While relevant, these measurements have low precision. In the circumstances it was not possible to fully examine caries or periodontal status, but these were included as parts of the need judgement. Caries was examined by visual inspection in artificial light and periodontal status basically by tactile mobility. In addition, suspected malignancies of the oral cavity were examined. Treatment intention, based on the assessed general health

Table 2. Treatment need index (TNI) describing the examiner's judgement of the different levels of realistic treatment need

Level	Realistic treatment need
No risk	No treatment need.
Minor risk	Preventive treatment need met by the use of prophylaxis.
Major risk	Reparative treatment need, not possible to be met by the use of prophylactic measures only.
Urgent need	Emergency treatment need. The patient is in pain and/or has inflammatory or other changes in need of immediate treatment.

Table 3. Age characteristics of the examined sample according to form of care and gender ($n = 732$)

	n	Range	Mean ± *s*	Median
NH				
Men	156	46–98	84 ± 8	85
Women	374	64–102	86 ± 7	86
HC				
Men	75	30–94	77 ± 13	82
Women	127	41–101	81 ± 11	82
Σ	732	30–102	83 ± 9	85

NH = nursing homes; HC = municipal home care.

Table 4. The percentage distribution of remaining own teeth (teeth) and prosthetic status in subjects in nursing homes (NH) and in municipal home care (HC), respectively ($n = 723$)

	Teeth	NH	HC	Total	*n*
No. of remaining own teeth	0	46	33	42	305
	1–10	22	22	22	157
	11–20	22	25	23	165
	>20	10	20	13	96
	Σ%	100	100	100	
	n	522	201	723	
	Dentition	NH	HC	Total	*n*
No. remaining own teeth	No dentures	5	2	4	29
	Only upper RFD	8	6	7	50
	Complete RFD	33	25	31	221
	ISP	1	1	1	5
Remaining own teeth	Only own teeth	17	26	20	143
	Own teeth + RPD	15	16	15	110
	Own teeth + RFD	17	19	18	132
	Own teeth + RFD + RPD	4	4	4	30
	Own teeth + ISP	0	1	0	3
	Σ%	100	100	100	
	n	522	201	723	

RFD = removable full denture; RPD = removable partial denture; ISP = implant supported prosthesis.

of each subject, and treatment need were estimated by the examiner as a treatment intention index (TII) and a treatment need index (TNI), respectively, previously tested for validity and reliability (Tables 1, 2) (27, 28).

Examination procedure

All examinations were performed in the subjects' own homes, with the patient on a chair or in bed, and by the same examiner, the author (RI), a dentist with more than 15 years experience of hospital dentistry, which includes dentistry for the elderly and disabled, in collaboration with the dental hygienist responsible for the district to which the examined subject belonged. The tools used were a dental mirror and a halogen lamp.

Statistical analysis

Statistical analysis was performed using SPSS 8.0 for Windows (39). The chi-square test and Student's *t* test were used for assessing statistical significance, the latter when distribution of the test variable was approximately normal. When testing for associations between binary variables, odds ratios were calculated, and the 95% confidence intervals given. Both ordinary and logistic regression analyses were used for multivariate analyses. Residual plots were inspected and model fit was assessed through multiple correlation, F-test, model chi-square, and calculation of the correctly predicted cases.

Table 5. Multiple regression with number of remaining own teeth as the dependent variable

Independent variables	Regression coefficient	*P*
Age	−0.4	<0.0001
Gender (male/female)	0.3	0.610
Housing category (NH/HC)	0.7	0.327
Intercept	39	

Adj. $R^2 = 0.16$, $F = 47.38$, 3/719 d.f., $P < 0.0001$.
NH = nursing home; HC = municipal home care.

Results

Age distribution according to form of care and gender is presented in Table 3, and number of remaining own teeth and prosthetic restorations in Table 4. Age was found to be strongly correlated with number of remaining teeth. For each year of age, the number of teeth decreased by 0.4 when tested in a bivariate regression analysis. When including gender and housing categories in a multiple regression model, this association remained unchanged. Gender and housing showed no association with the number of remaining teeth (Table 5). The distribution of remaining teeth according to age group is presented in Table 6, where it can be noted that 27 persons (3.7% of the studied sample) were <65 years old. Edentulousness increased with age ($P < 0.0001$; Student's *t* test), while for presence of a functional dentition, >20 teeth, the opposite situation pertained ($P < 0.0001$; Student's *t* test). These results were the same when the <65-year-olds were excluded.

Oral wounds and blisters were found among 9% and hyperplasias among 10%. Local changes in the palatal mucosa were registered in 22% of the subjects, and severe changes, i.e. general inflammation, were found in 9%. For the lingual mucosa, changes were observed in 14% of the

Table 6. The percentage distribution, within age group, of the number of remaining own teeth ($n = 723$)

		Age group					
						Σ	
	Teeth	<65 years %	65–74 years %	75–84 years %	≥85 years %	*n*	%
No. of remaining own teeth	0	7	20	38	52	305	42
	1–10	15	17	23	23	157	22
	11–20	26	30	24	20	165	23
	>20	52	33	17	5	96	13
	Σ%	100	100	100	100		100
	n	27	70	243	383	723	

cases, 90% of these changes being of the atrophic type. The clinical assessment of oral mucosal dryness was 59%, estimated as severe in 9% of the examined sample. Age differences were not detected for either of these variables. Two cases of suspected oral malignancy were found. One was diagnosed with biopsy as a malignancy of the salivary gland tissue, while the other was found to be a severe hyperplasia of the oral mucosa due to an ill-fitting denture, not a malignancy.

Oral hygiene status was considered to be good/acceptable in as many as 62%, and no/mild inflammation was registered for 84%. Of those registered as having good/acceptable oral hygiene status, only 11% presented with moderate/severe inflammation. Of those registered as having no/mild inflammation, 2/3 were considered as having good/acceptable oral hygiene and the other 1/3 as having bad/poor hygiene, this association being strong (OR = 2.7; 95% CI 1.8–4.1). For these variables, no significant differences were observed in relation to the form of care, NH and HC, respectively.

When considering the four different levels of mucosal inflammation (no, mild, moderate, severe), the subjects ≥85 years of age revealed a significant difference as to type of LTC ($P = 0.0003$); thus almost twice as many of those 85 years old or older living in NH had no or moderate inflammation compared with those 85 years old or older within HC. This significant difference between the two types of LTC was true also among edentulous subjects in the oldest age group, ≥85 years ($P < 0.0005$). There were no such differences for the other age groups (<65 years, 65–74 years, and 75–84 years).

Table 7. The percentage distribution of estimated treatment intention (TII) in relation to estimated treatment need (TNI) in the studied sample ($n = 719$)

		TNI		
		No/minor risk	Major/ urgent risk	Σ
TII	Emergency/palliative care	29	17	46
	Limited/comprehensive care	41	13	54
	Σ	70	30	100

Odds ratio = 0.57; 95% CI 0.42–0.79.

The assessed treatment intention and treatment need are given in Table 7. When subjects assessed as no/minor risk (70%) were separated, 39% were assessed as being at no risk and 31% at minor risk. For the latter group with only preventive treatment need, this had to be met by a dental hygienist. A major/urgent risk, i.e. a reparative or an emergency treatment need, which had to be met by a dentist, was estimated in 30% of the examined persons; 29% were assessed as having a major need and only 1% an emergency need. For example, a person with broken teeth/roots without acute inflammation could be judged as having a major, i.e. reparative, need. Persons with ongoing extensive inflammation, abscesses, or suspected malignancies were judged as having an emergency need.

The subjects within HC had bivariately twice the possibility of being allocated to a high treatment intention level compared to those in NH (OR = 2.09; 95% CI 1.49–2.94). Keeping age, treatment need, and gender constant in a multivariate model for the dentate subjects, the bivariate association remained and was even stronger (Table 8). The association with age was negative, i.e. there was an assessment of a less active treatment intention at higher age. There was no association with gender, while the association with assessed need was strongly negative. Also this association was strengthened going from bivariate to multivariate analysis, and when restricting the analysis to the dentate subjects. Bivariately for all, treatment need had an OR of 0.57 (95% CI 0.42–0.79). Those edentulous were excluded, because when a patient was edentulous treatment intention was generally limited to either emergency or limited care.

Discussion

In describing the oral health situation and the oral treatment need among elderly, disabled persons, a number of studies have been performed (22, 40–43). In general, these deal with selected groups mainly describing the normative treatment need even if there are some exceptions (18, 23, 36). The present study differs from those previously presented, as the subjects are allocated to one of four groups of treatment need; no need, minor (prophylactic) need, major (restorative) need, or urgent

Table 8. Logistic regression model among dentate subjects with treatment intention (emergency/palliative care and limited/comprehensive care) as dependent variable

	Dentate ($n = 415$)	
	O.R.	*P*
Age	0.95	0.0001
Housing category (NH, HC)	2.8	<0.0001
Gender (male, female)	1.2	0.361
Treatment need (no/minor, major/urgent)	0.3	<0.0001

For dentate: Model chi-square = 80.1, 4 d.f., $P < 0.0001$, 67.0% correctly classified.
NH = nursing home; HC = municipal home care; O.R. = odds ratio; *P* = probability.

need. Further, this allocation is guided by the examiner's decision regarding the appropriate level of treatment intention; to relieve (emergency care), delay (palliative care), maintain (limited care), or improve (comprehensive care). This study also describes the oral health and the oral treatment need in a whole population of persons enrolled in municipal LTC. Actually, the presented drop-out (15%) was less taking into account the drop-out dependent on factors not possible to control for; subjects who had deceased, had been hospitalized, moved, etc. The true drop-out, those reached but not participating for some reason, in all 57 persons, was therefore only 7%.

The comparatively low oral treatment need as presented in this study might be considered surprising, when the results presented in earlier studies are taken into account (18, 22, 23, 36, 40–43). It must be emphasized, however, that in this study the normative oral treatment need has not been estimated, as this is not realistic when making plans for allocating resources to this population group of medically compromised persons. Instead, for this purpose it must be considered as more important to describe what is estimated as the realistic, not the normative, treatment need. As many of the persons within LTC, owing to greatly diminished physical or mental capacities, are unable to express self-perceived need or express demand for dental treatment (36), our concept of examination is focused primarily on judgement by the examiner on improving oral comfort and on informing about an assessed realistic oral treatment need.

Only 20% of those 65–74 years were edentulous. In the oldest subgroup, those ≥85 years, 52% were devoid of their natural teeth, a figure roughly comparable to that of other Scandinavian studies (12, 18). The modest rate in which persons in this population group are losing their natural teeth might be illustrated by the fact that, as a mean, only 0.4 teeth were lost yearly, i.e. in 10 years the dentition was reduced by 4 teeth. However, it must be underlined that the observed loss of teeth does not reflect what actually happens during LTC, the effect of caring not being accounted for in this study. In order to answer that question, a longitudinal study has to be performed in a LTC population. A reasonable objective to achieve within a long-time care organization must be to offer care-receivers assistance with daily hygiene procedures, in this case oral hygiene, facilitating for the care-receivers maintenance of the oral health status they had when enrolled, before their capacities were severely impaired (18, 36). The importance of maintaining an acceptable oral function must be emphasized, persons with disabilities having difficulty adapting to changes in the functional situation (18). Also the psychological aspects of tooth loss must be considered, because frail adults, who are dentate, have the same attitude to the importance of retaining one's own natural teeth as healthy adults (17). At the same time, the medically compromised are unable to endure extensive dental treatment. This highlights the need for prophylactic rather than restorative measures, as oral treatment need is reduced with improved oral hygiene (44). As a consequence of this argument, the treatment intention level was regularly limited for those edentulous. This also contained an ethical aspect; it was not considered the task of the examining dentist to press the patient into demanding dental treatment.

The prevalence of oral mucosal changes varied, being related mainly to the wearing of removable dental prostheses, wounds and hyperplasias resulting from ill-fitting prostheses and changes of the palatal mucosa to poor prosthetic hygiene. The most alarming mucosal change found was one previously undetected oral malignancy. In our opinion, this single observation is a motive for the whole oral health-screening program, as regulated in the new Swedish Dental Health Insurance.

Assessment of oral mucosal dryness was performed in a simple way in estimating the friction between a dental sliding mirror and the buccal mucosa (37), a method suitable for screening purposes. Oral mucosal dryness can be examined in different ways (45, 46), but the method used in this study gives an indication of the condition in the mouth. There was a high rate of clinically assessed oral mucosal dryness, this condition being related to oral discomfort and reduced quality of life (47). It should be borne in mind that oral comfort and social functions such as aesthetics and ability to communicate may be more important for the individual than pure mechanical function (48). Xerostomia, strongly associated with pharmacotherapy (49–51), is also related to hyposalivation, a decreased salivary flow, putting subjects at risk for oral diseases, especially dental decay. It has also been demonstrated that in elderly, disabled subjects there is a covariation between hospitalization, salivary variables, and the presence of plaque, also increasing the risk for dental decay (52). Further, daily oral hygiene practice might be part of minimizing non-oral sequelae of oral infections (53).

Somewhat surprising, but satisfactory, was the observation that as many as 62% of those examined were considered to have good or acceptable oral hygiene status. This figure might further improve once dental hygienists are acting routinely as advisers in LTC facilities. Also satisfactory was the fact that 84% of the examined sample had either no or only mild oral inflammation, the

covariation between oral hygiene and oral inflammation being illustrated by the fact that only 11% of those with good or acceptable oral hygiene presented with moderate or severe oral inflammation. An interesting observation was the significant difference between the prevalence of oral inflammation due to type of LTC, subjects in NH having more inflammation. Also this situation ought to improve with the regular presence of dental hygienists within caring institutions.

The new Swedish Dental Health Insurance prescribes that the oral health evaluation has to be performed in the care-receiver's own dwellings, either in the caring institution or in the subject's home. This means that the examinations have to be carried out using simple aids, dental mirrors, and a portable light, such as a halogen lamp. This, in turn, excludes more sophisticated registrations, one reason for developing the very simplified TNI. The other index, the TII, allows the therapist to delimit oral treatment to an extent determined by the individual's medical condition. This estimation of the 'realistic' treatment need is not entirely new, previously having been suggested by Vigild (36) and modified by Jokstad et al. (18). To the best of our knowledge, the intention to treat has not been expressed as pragmatically as with the suggested TII.

It is not surprising that the TII was related to age, because with increasing age the subjects are more frail and medically compromised, and their condition not inviting to more extensive oral treatment. Also, the negative correlation between TII and TNI is what has to be expected, provided the evaluation is correct. What might be considered surprising, though, was the higher treatment intention found for subjects within HC as compared to those in NH. This is explained by the high prevalence of edentulous persons in NH who were classified as having a low treatment intention level if they had no dentures or only one. The intention for those with removable full dentures was to maintain the present oral situation, i.e. for persons with full dentures to be able to keep them.

In conclusion, this study emphasizes the importance of offering regular oral health evaluation to persons within long time care. It also demonstrates that when intention to treat is related to the individual's medical condition, the treatment need is modest and to a considerable extent possible to meet by means of prophylactic measures, although restorative treatment must supplement preventive treatment. This fact highlights the key role the dental hygienist, along with the dentist, has in the realization of the law-regulated out-reach oral health activities among persons within LTC in Sweden, both as a prophylactic therapist and a consultant to the nursing staff.

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